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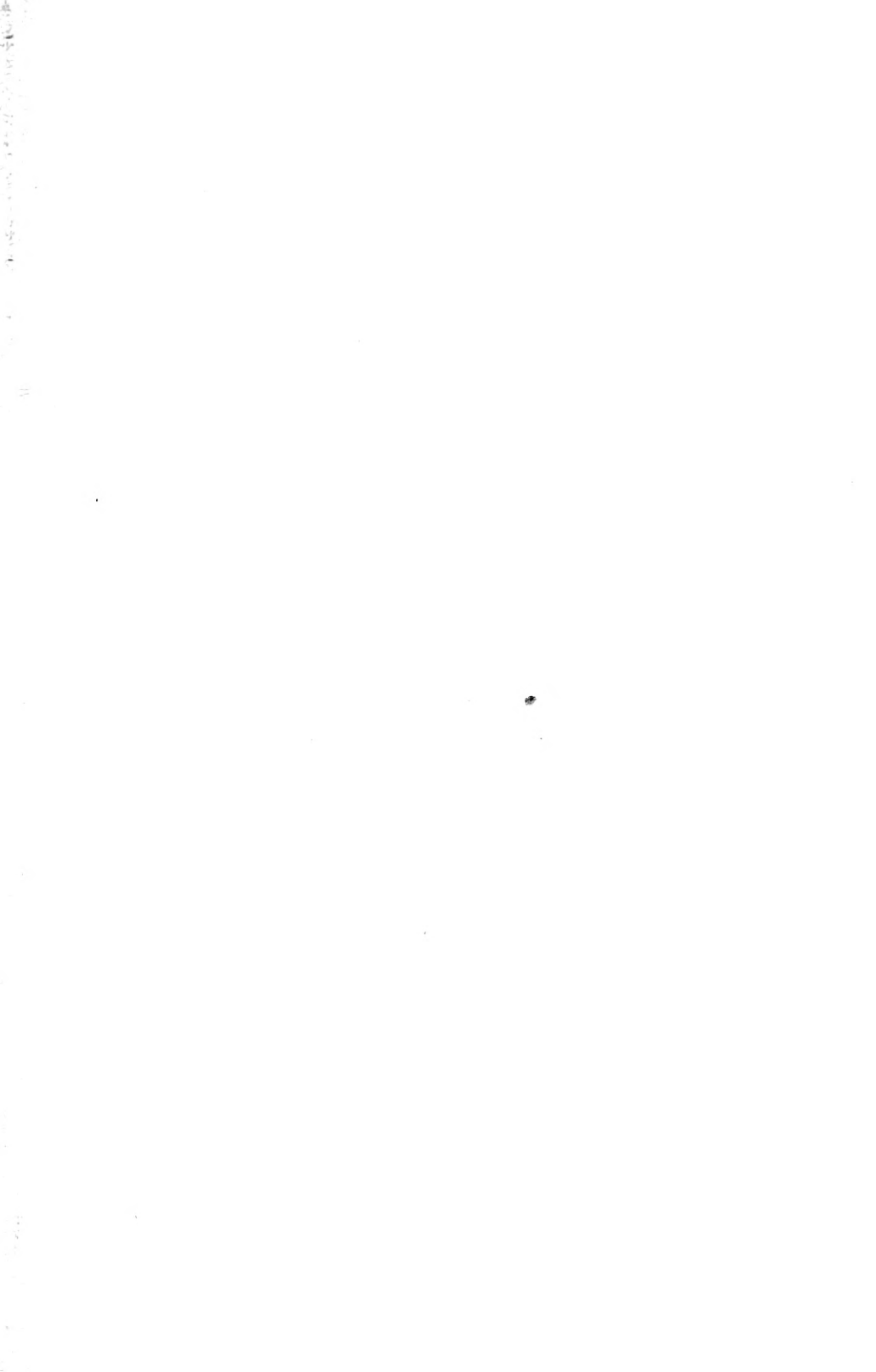


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1917



EDINBURGH MEDICAL JOURNAL

PRINTED BY
GREEN AND SON
EDINBURGH

EDINBURGH MEDICAL JOURNAL

EDITED

BY

ALEXANDER MILES & J. S. FOWLER

NEW SERIES

VOL. XIV



Published for the Proprietors by
W. GREEN & SON, LTD.
EDINBURGH AND LONDON

1915



EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES.

1915.

WAR, which in its course is mere destruction of all civil institutions, and ends in victory only when the enemy is utterly disorganised, must sooner or later end and be followed by a period of reconstruction. A great war alters values once and for all, and the prediction may be made with assurance that by the time the present conflict ceases our outlook will be greatly and permanently changed.

With the coming of the New Year it is hard to avoid speculating on what the future has in store, and for us as doctors it is natural to wonder how our own profession in particular will be affected, for affected it certainly will be, and in more ways than one.

Perhaps the most immediate prospect that confronts us is a scarcity of doctors. Before the war there had for some time been hints of this, as was shown by the difficulty hospitals were experiencing in filling unpaid junior appointments, and quite probably the time is not far off when even large teaching hospitals will be unable to obtain gratuitous service from the resident staff. The number of entrants into the medical profession is likely to fall off for the next few years on account of the large number of undergraduates who have interrupted their studies to fight the common enemy, and the number of recently qualified men presently available for civil practice must be relatively small, considering how many have entered or will enter the Army Medical Corps. Moreover, the fact that so many of the younger men begin their careers in a medical service will bias a number towards this kind of work and against the uncertainty of practice, and will produce a frame of mind favourable to the extension of medical services in general (we use the word widely, to include all forms of public health, school, and institutional work), a frame of mind which will fall with little resistance into line with the whole trend of modern social legislation.

On the whole, then, it seems not unlikely that one of the outcomes of the war will be to hasten an evolution which has already begun, and

that in the future fewer graduates will follow the old routine of a junior hospital appointment succeeded by entry into private practice, and that more will from the beginning of their careers look forward to, and prepare for, some definite salaried appointment.

On the scientific side of medicine, also, changes are likely. In the past Germany has been the world's great post-graduate school, and German methods, instead of merely inspiring, have dominated our own. War has broken off all scientific intercourse, and the glimpse of the spirit animating German intellectualism which it has revealed will not soon be forgotten. However much Chauvinism in science is to be despised, let it be remembered that there is an anti-patriotic as well as a patriotic bias, and that one is to be avoided as much as the other. While, however, we shall do more justice than formerly to British research, it will be as necessary as before to broaden the outlook by foreign study, and yet for a good many years to come English students will neither wish to go to Germany nor will they be welcomed there. Of late the interchange of post-graduates between this country and the United States has grown apace, and we anticipate that in the future more and more of our young graduates will study in America, where no language difficulty exists, where private endowments vie in liberality with the State aid of Germany, and where originality and enterprise have created clinics and laboratories second to none. There is also little doubt that more students will seek ideas in France. Her intellectual sincerity has never waned, though to some it seemed eclipsed in 1870, and the new spirit, serious and practical, which animates young France cannot but reflect itself in science and teaching, and will surely attract an ever-growing influx of graduates to the land of Pasteur, Metchnikoff, and Charcot.

In medical education at home there has been a cry for the introduction of reforms modelled chiefly on the German system. The series of articles we published in 1913 on this subject drew attention to the defects and dangers of this system, as well as its merits. Perhaps now the merits seem less, and the defects greater, than they did then. In any case we shall be compelled to consider more carefully than ever how a system will work in this country, and not be satisfied with the argument that it works well elsewhere.

In this country, too, we have often been discontented with the scant encouragement the State offers to science, and have envied the support the German savant receives. We have now learned that he pays the price in the conscious or unconscious surrender of his intellectual freedom, and we have learned, too, that in a country where the State is the source of all honour and emolument he is most honoured and rewarded who, whatever his department of science, will lend the weight of his name at the bidding of the State. To realise this danger is to avert it, and happily there is no sign here that along

with the growing recognition by the State of its duty to higher teaching and research there is any question of asking the surrender of independent opinion.

So far as concerns the public health, the most apparent effects of the war has been a widespread anxiety to "bear one another's burdens." This great spontaneous outburst of social work cannot but leave traces. Numbers of those who have begun to interest themselves in their poorer brethren will not forget what they have learned, and will wish to continue work when peace returns, for the habit of giving, whether money or service, is not readily lost. The directions in which these forces may be utilised are many—in our own city, for instance, the institution of a system of schools for mother and infant consultations is contemplated.

The enlistment of between two and three million men has brought to the front the question of venereal disease. For the first time the public are beginning to realise that this is a serious problem, from the health standpoint, associated with universal military service. Among these millions of men a beginning is being made to disperse the ignorance of the nature of syphilis and gonorrhœa, which is so marked a feature in England. As we have urged before, so long as this ignorance exists, nothing effective can be done to check their spread. By the time the recommendations of the Royal Commission are issued, the soil will be prepared, and we may expect, with more confidence than before, that something practical will be done. Assuredly, if, as seems probable, some form of universal military training is adopted, the need for controlling venereal disease will be more than ever clamant.

Such are some of the ways in which, it would seem, the war will affect medicine in its professional, scientific, and sociological aspects. In general science we are the amazed witnesses of the erection of boundaries and barriers where hitherto there have been no frontiers. It is difficult to conceive of international scientific gatherings for years to come. Nor does the temper shown by those scientists who have purged themselves of foreign academic honours hold out hope of any early reconciliation after the peace which can only be brought about by the overthrow of reaction.

**Resignation of
Professor Wyllie.**

THE resignation of Professor John Wyllie, on account of ill health, is intimated. Professor Wyllie has occupied the Chair of the Practice of Physic since 1900, and at the time of his appointment he had already served his full term of fifteen years as physician to the Royal Infirmary and seven years on the assistant staff. Thirty-seven years of active hospital work and clinical teaching is a record of which any man may be proud, and in the retrospect Professor Wyllie has the

happiness of knowing that he was admired and esteemed both as a man and as a teacher by generations of his pupils, and that he brightened the days of many sufferers. We share in the general regret for the cause which has put a term on Professor Wyllie's active career, and trust most sincerely that, freed from the arduous work of his Chair, he may soon be restored to health.

Pathological Studies. WE would draw attention, in a word, to a new feature which begins in the present number of this *Journal*. The purport of the Studies which issue from the Pathological Department is sufficiently indicated in Professor Lorrain Smith's prefatory note, and we believe that they will be appreciated by our readers.

Sir John Struthers
Lectureship. JOHNSON SYMINGTON, M.D., F.R.C.S.(Edin.), F.R.S., Professor of Anatomy, Queen's University, Belfast, delivered the second of the Struthers Lectures in the College of Surgeons on the 16th instant, the subject being "Observations on the Relations of the Inner Surface of the Cranial Wall to the Outer Surface of the Brain," illustrated by specimens, casts, and photographs. We hope to publish the Lecture in an early issue.

CASUALTIES.

WOUNDED in action in France, Lieutenant JOHN PHETHEAU CHARNOCK, M.B., R.A.M.C.

Lieutenant Charnock graduated in Edinburgh in 1910, and acted as House Surgeon in St. Mary's Hospital, Manchester, and at St. Mary's Hospital, Plaistow. He was a civil surgeon, R.A.M.C., in South Africa before the outbreak of war.

PRISONER of war. Captain H. G. ROBERTSON, M.B., R.A.M.C., is unofficially reported a prisoner of war.

Captain Robertson graduated in Glasgow in 1908.

DISTINCTION.

LIEUTENANT H. BEDINGFIELD, M.B., R.A.M.C., has received the Distinguished Service Order for his services with the Expeditionary Force.

Lieutenant Bedingfield graduated in Edinburgh in 1911, and received the D.S.O. "for coolness and daring in repeatedly superintending removal of wounded from the firing line under heavy fire."

STUDIES FROM THE PATHOLOGICAL DEPARTMENT
OF THE UNIVERSITY OF EDINBURGH.

INTRODUCTION.

IN the course of pathology the student encounters difficulty in correlating the clinical facts of disease with the changes in the organs observed on post-mortem examination, or with the results of microscopic investigation: the same problem arises also in the study of tissues removed by operation.

To overcome this difficulty a teaching collection of specimens has been formed, arranged, and described on the principle that each case is to be considered as a whole. The development of the case, which is described in the clinical account of the patient's history and symptoms, reveals the extent to which the various systems have been involved in the progress of the disease. The post-mortem examination and the subsequent microscopical study of the affected organs give an account of the sequence of events as it is portrayed in the pathological lesions grouped together in the case. Finally, in a review of the whole case these two accounts are compared, with the purpose of bringing out clearly the relation of clinical symptoms with pathological changes.

In order to bring this method of study within reasonable compass a number of outstanding and typical cases have been selected and worked out in full detail, and the student is directed to give to these special attention. He is also required to prepare reports of this type on cases as they occur in the post-mortem room, and this forms a large part of his work in practical pathology.

By this method pathology becomes an introduction to clinical work to an extent which is impossible where the student is restricted to the more abstract questions of morbid anatomy, and his general interest in pathology as a branch of medicine becomes the more living.

The working of this method can be explained more easily by giving examples. It is proposed to publish a number of cases, the reports of which have been drawn up on the lines described, and the following case of carcinoma of the pylorus is the first of these.

J. LORRAIN SMITH.

CASE I.

Day Book, 400.

Museum Book, 508, 508A, 509, 510.

CASE OF CARCINOMA OF THE PYLORUS, OLD OBSTRUCTION IN LEFT CORONARY ARTERY, WITH ORGANISED INFARCT OF HEART WALL AND ANEURYSM FORMATION. RECENT PULMONARY THROMBOSIS.

The patient was a man, aged 69, who was admitted to Chalmers Hospital on 24th October 1913 and died on 2nd November 1913.

The history was that in August 1913 he noticed that his bowels were becoming constipated and he was losing weight. In September, six weeks before admission, he commenced to vomit his food daily and had repeated "bilious" attacks. He had no pain and no flatulence. In the six weeks before admission he lost 1½ stone in weight.

Previous History.—Forty-five years ago he had malaria in India. *Four years ago* he had a sudden fainting attack at a meeting, but was not laid up by this. There was no history of rheumatism or syphilis.

On admission the patient was a spare, anxious-looking man. The abdomen was flabby, but on palpation there was slight resistance above the umbilicus. The lower border of the stomach was one inch below the umbilicus. Nothing was felt per rectum.

Nothing abnormal was noticed clinically in the other systems beyond slight rapidity of the pulse, but its impulse was strong.

A test meal was given, and examination of the stomach contents showed residual food, no free hydrochloric acid, no free lactic acid, no sarcinae, but a few red blood corpuscles.

An X-ray examination after a bismuth meal showed the stomach dilated and hanging low down, and to right of mid-line.

On 31st October 1913 Mr. Stiles performed laparotomy. A tumour at the pylorus was found, with small nodules of growth studded over the omentum. The wall of the jejunum appeared to be thickened and the lymphatics were dilated and filled with chyle. A posterior gastro-enterostomy was done. Shortly after the operation the patient vomited a little blood but otherwise felt fairly well.

On 2nd November 1913 at 7 A.M. the patient was weak. The pulse was 120, but its impulse was strong. The stomach was washed out and this gave much relief. He remained well till 6.30 P.M., when he suddenly collapsed. There was pallor with slight dyspnoea, and soon the respiration ceased. There was no cyanosis.

NOTES ON THE POST-MORTEM EXAMINATION.

The specimens are:—Stomach, Liver, Spleen, Kidney, Heart and Aorta (M. B., 508); Coil of Intestine (M. B., 509); Lung (M. B., 510).

In the abdomen the *peritoneum* showed a number of small white or yellow nodules on both parietal and visceral layers. See specimen (M. B., 509) (Plate I, Fig. 2) which shows these nodules scattered over a coil of small intestine.

There was a large mass at the pyloric end of the *stomach*, and over it appeared yellowish nodules which extended into the subjacent *omentum*. There were also beaded lines of tumour deposit over the serous coat of the pyloric end of the stomach. The *stomach* was not now dilated.

The mucous membrane was much congested, and in it were many small petechial hæmorrhages. At the pyloric end was a mass of new growth, with ulcerated areas on its inner surface. This tumour extended through the stomach wall to the serous coat, forming the nodules noticed above. There was no narrowing of the lumen.

The specimen (M. B., 508) (Plate I, Fig. 1) illustrates these points. Towards the left side of the stomach is the tumour involving the pylorus. The ulceration on its inner surface is obvious and the white masses of tumour extending through the muscle coat, which is in places quite destroyed. On the serous surface at this part the tumour appears as larger or smaller nodules. Note how the tumour does not extend into the *duodenum*.

The rest of the stomach wall is congested, and at the cardiac end little red areas of hæmorrhage are visible. At the lower border of the specimen, on the greater curvature, is the gastro-enterostomy opening. In the *omentum* are some tumour nodules.

On the posterior aspect of the specimen are a number of enlarged glands of a uniform white colour, from infiltration with tumour. These glands lay around the celiac axis and head of the pancreas.

Microscopically (Plate II, Figs. 1, 2, 3).—A section has been taken from the margin of the growth in the stomach wall. At the surface there is a mass of tumour which has pushed up the mucous membrane and largely destroyed it. The submucous and muscular coats subjacent are extensively infiltrated with tumour; and in the muscular wall further away are small collections of tumour cells (Plate II, Figs. 1, 3).

With a higher power the mucous membrane is seen to be in a state of acute catarrh, the epithelium is granular and broken up—part of this change is autolytic, after death—the glands are dilated, and

amongst the gland tubules are many polymorph and large mononuclear cells. The muscle coat is atrophied, the fibres are separated by œdema, and there is distinct fibrosis extending from around the tumour deposit.

The tumour consists of masses of cubical and columnar cells, in some parts definitely arranged in irregular acini. Some of the smaller deposits are in dilated lymph spaces, the walls of which can be distinguished. The larger deposits lie amongst the muscle fibres and have a delicate supporting fibrous stroma in which run the blood-vessels. In the large surface mass, and, to a varying degree, in the deeper deposits, there is a marked infiltration of polymorph leucocytes, which separate up the tumour cells in many instances (Plate II., Fig. 3).

A section of the *duodenum* close to the pylorus shows an infiltration with similar tumour masses. The greatest deposit is in the subperitoneal and outer muscular layers. In the submucous and mucous coats the deposits are much smaller and are scattered.

It was noted that macroscopically the tumour did not extend on to the mucous surface of the duodenum, and this infiltration, seen microscopically, is obviously due to a spread in from the affected omentum adjacent. In the duodenal deposits there is the same leucocyte infiltration of the tumour (Plate II., Fig. 2).

In sections from nodules in the *omentum* adjacent to the stomach the tumour cells have the same character but the acinar arrangement is hardly to be found. The individual tumour cells, or small clumps of them, are separated by great numbers of polymorph leucocytes.

In this section, as in those from stomach, there is seen phagocytosis of polymorph leucocytes by the tumour cells. Around the nodule is a zone of fibrous tissue, the inner layers of which are infiltrated with polymorphs, while the outer layers and the tissue around contain a moderate number of lymphocytes and a few eosinophile cells.

The *liver* was small and there were no secondary deposits of tumour in it. The mounted portion shows the centres of the lobules dark brown in colour while the peripheral areas are pale yellow.

Microscopically.—The central veins are slightly dilated, but there is little engorgement of the capillaries. The liver cells around the central vein contain granules of yellow pigment and are atrophied and faintly staining. Those towards the periphery of the lobule are better stained and more normal in size and many contain fat spaces. It is an example of pigmentary atrophy and slight fatty degeneration.

The *spleen* was small and atrophied. The specimen shows some congestion of the pulp and small Malpighian bodies.

A *microscopic* section shows the Malpighian bodies small in size, and in many the central arteriole shows hyaline degeneration of its intima. In the section stained by "van Gieson" the hyaline material is a homo-

PLATE I.

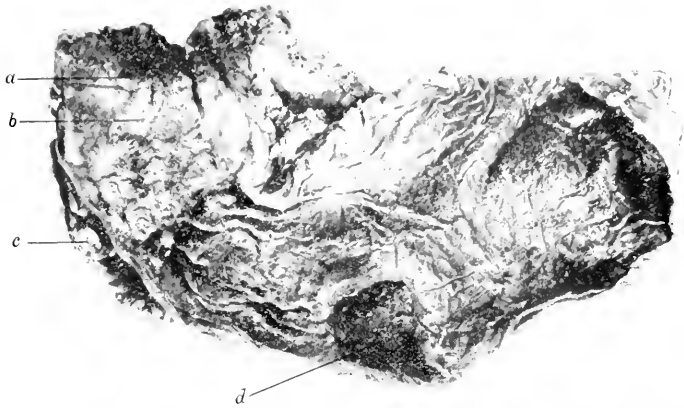


FIG. 1.—Stomach with anterior half removed. (*a*) Pylorus; (*b*) large mass of cancer at pyloric end of stomach (note extension through wall); (*c*) nodule of tumour in omentum; (*d*) gastro-enterostomy opening.

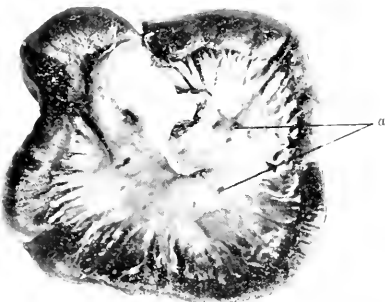


FIG. 2.—Coil of small intestine with attached mesentery, to show (*a*) small nodules of tumour on peritoneum.

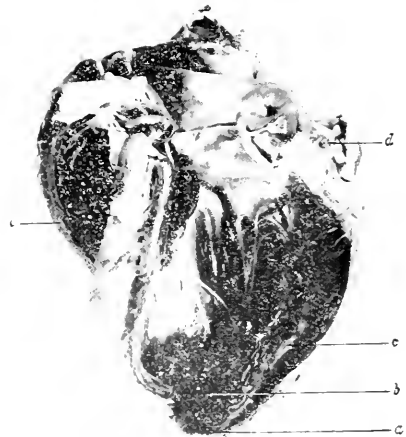


FIG. 3.—Heart. (*a*) Aneurysm at apex (note thin fibrous wall); (*b*) cavity of aneurysm filled with thrombus; (*c*) wall of left ventricle showing white strands of fibrous tissue; (*d*) obstructed left coronary artery (note minute lump near centre); (*e*) wall of right ventricle showing fatty infiltration.



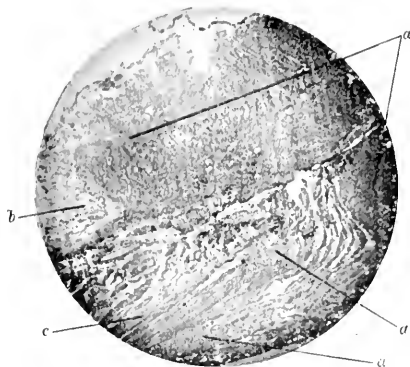


FIG. 1.—Very low power ($\times 10$) of edge of tumour mass in stomach. (*a, a, a*) Deposits of tumour in mucous and muscular coats. The large deposit in the mucous coat has pushed up and destroyed the mucous membrane (*b*); (*c*) is muscular coat.

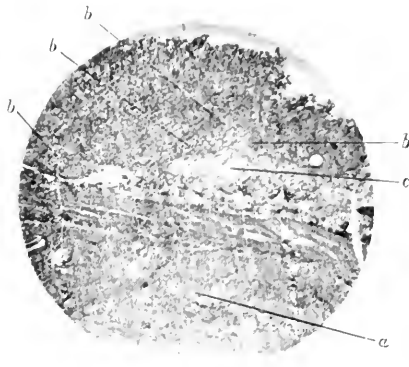


FIG. 2.—Very low power view ($\times 10$) of duodenum just beyond pylorus. (*a*) is a large deposit of tumour in the subperitoneal and outer muscular layers. (*b, b, b, b*) are small deposits in the submucous and mucous coats; (*c*) indicates Brunner's glands.

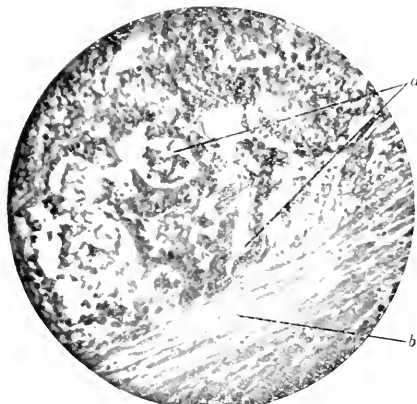


FIG. 3.—High power ($\times 200$) of same deposit. (*a*) indicates the tumour in the form of acini lined by columnar or cubical cells. Some acini contain free tumour cells and leucocytes. In the stroma are many leucocytes; (*b*) is the muscle layers around showing atrophy of the fibres and slight fibrosis.

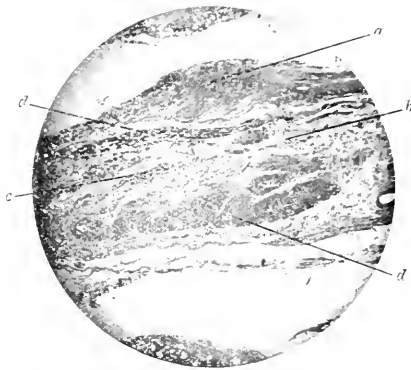


FIG. 4.—Very low power view ($\times 10$) of left ventricle near apex. (*a*) Dense fibrous area under endocardium; (*b*) looser fibrous tissue extending amongst muscle bundles (*d, d*); (*c*) small vessels, with thickened walls, in fibrous tissue.



FIG. 5.—Low power ($\times 50$) of portion of same. (*a, a, a*) Muscle bundles with strands of fibrous tissue running amongst them; (*b*) area of loose fibrous tissue; (*c*) small blood-vessels with thickened walls.

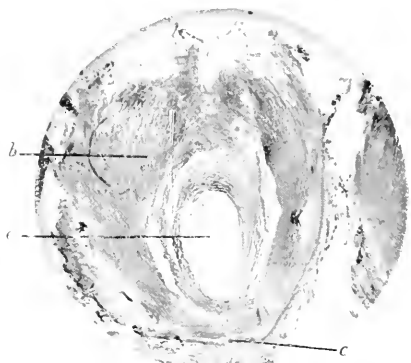


FIG. 6.—Very low power ($\times 10$) of transverse section of left coronary artery near its origin. (*a*) Narrowed lumen; (*b*) greatly thickened fibrous intima; (*c*) atrophied fibrous media.

geneous yellow colour. The pulp is engorged with blood but the pulp cells are scanty.

The *kidneys* were of usual size. The capsule stripped off readily and the surface was smooth. A portion of one is mounted to show the venous congestion, especially marked in the straight vessels of the pyramids, and some cloudy swelling of the tubules of the cortex. In the largest pyramid shown there is a pearly-white nodule which is a small fibroma. The larger renal vessels are not thickened.

Microscopically.—The tubules are dilated and the secreting cells are atrophied and of a low cubical type; their cytoplasm is granular. The glomeruli are engorged. A few of the intertubular cortical capillaries are congested, and all the straight vessels of the pyramid. There is no increase of interstitial tissue. The renal vessels show no thickening.

The *heart* was slightly enlarged transversely. The coronary arteries were tortuous, and at the apex there was an old fibrous adhesion to the pericardium. The right side was moderately dilated and the chambers filled with post-mortem clot. The tricuspid valve was slightly dilated, and the pulmonary valve healthy. In the pulmonary artery was a stringy thrombus, pale in colour and tough on surface, but more friable and dark in colour in its interior. This thrombus extended along the branches of the artery into the lungs (*q.v.*). The left auricle and ventricle were dilated and filled with post-mortem clot.

The specimen (M. B., 508) (Plate I, Fig. 3) shows the further points, viz.:

The muscle of the right ventricle is infiltrated with fat. The left ventricle is dilated, especially at the apex. On the septum, near the apex, is a white patch of subendocardial fibrous thickening. The cut edge at the apex shows the wall greatly thinned and composed of white strands of fibrous tissue, with practically no muscle tissue remaining between them. This area has yielded and so formed an aneurysm of the heart wall. In the muscle above this white fibrous strands are seen extending through it. In this dilatation there is a reddish mass of thrombus with a pale periphery; here it was adherent, but the centre was softened and friable. The mitral and aortic cusps show patches of chronic degenerative thickening. The aortic valve was competent. The left coronary artery, about $\frac{1}{2}$ an inch from its origin, was greatly narrowed by fibrous thickening, in the centre of which there appeared to be a minute lumen. The cut surface of this obstructed vessel is seen in the specimen, just to the inner side of the tip of the left auricular appendix. The right coronary artery was very atheromatous. The aorta shows little patches of atheroma throughout it.

Microscopically (Plate II., Figs. 4, 5).—The thinned portion of the left ventricle near the apex consists very largely of fibrous tissue. This is in the form either of thick, almost hyaline, strands, quite free

from muscle fibres, or of a more open network of fibres, amongst which are scattered groups of, or individual, muscle cells. In the ventricle higher up sections show much more muscle but also bands of fibrous tissue running amongst the muscle bundles. The small vessels are thickened and lie in the midst of the fibrous strands.

A section of the coronary artery where it was seen almost obliterated (Plate II., Fig. 6) shows only a small lumen eccentrically placed. Around this is a thick laminated deposit of fibrous tissue, in the outer layers of which are spaces due to degeneration of some of the tissue. The elastic lamina—seen in the section stained by Weigert's method—is in many parts absent, in others it is stretched, irregularly thickened, and fragmented, and in parts fibrillated. The elastic tissue in the media appears diminished, and there is none seen in the thickened intima.

Lungs.—Both were small and deeply pigmented, and there was some emphysema along the margins. On section there was considerable congestion. In both lungs the main branches of the pulmonary arteries were filled with firm, stringy thrombus, similar to that already described in the pulmonary artery.

The specimen (M. B., 510) consists of portions of each lung. The upper is the lower part of the right lung; the lower is the inferior border of the left lung. In the upper portion—right lung—the thrombus is seen lying in the pulmonary artery, but adherent to the wall at one side only. In this lung there was no infarcted area. In the other lung there was similar thrombus in the corresponding artery, and, in addition, a small area of recent infarction at the lower and posterior border. The vessel leading to it is seen filled with dark thrombus.

A *microscopic* section taken from the margin of the lung shows emphysema, the alveoli being distended and their walls thinned and broken up in parts. Other alveoli show congestion of their capillary walls. In one or two areas, seen best near a larger pulmonary artery, there is collapse of the alveoli. In some alveoli coagulated oedematous fluid is seen. In the centre of the section this artery is seen plugged with a recent thrombus composed of fibrin, leucocytes, and red corpuscles. A section of the thrombus from the main pulmonary artery has a similar structure. The bronchi are contracted but show no other change.

SUMMARY AND DISCUSSION.

This case is of much interest on account of two separate and distinct pathological conditions—the *tumour of the stomach* and the *aneurysm of the heart wall*.

The patient only began to experience trouble from the stomach condition four months before his death. The first symptoms were the

constipation and the loss in weight unaccompanied by any definite dyspepsia. As the disease progressed vomiting began, and he had "bilious attacks," and these are to be correlated with the erosion of the mucous membrane by the tumour and the resultant gastric catarrh set up. Pain, a frequent symptom of gastric carcinoma, was absent. Although the tumour began in the pyloric region, it had not caused much obstruction to the passage of food and so no dilatation resulted. The clinical examination showed distension of the stomach, but, as noted, no dilatation was evident post mortem.

When admitted to hospital the patient was wasted, but nothing definite could be felt in the abdomen. A test meal revealed the absence of free hydrochloric acid, lactic acid, and sarcine, but some red blood corpuscles were present. The last had come from small hæmorrhages from the eroded mucous membrane. The absence of free hydrochloric acid is a fairly constant feature of gastric carcinoma, but it has also been observed in malignant tumours in other situations. The acid may also be absent in chronic gastric catarrh with atrophy of the mucous membrane, and in some nervous conditions. Its significance is not yet settled. It may be due to direct damage to the glandular epithelium of the stomach, or it may be due to a general alteration in metabolism, which makes it difficult for the cells of the gastric mucosa to separate out the acid.

Where there is obstruction at the pylorus with resultant retention of food and dilatation of the stomach fermentation takes place, and acids such as lactic and butyric are formed, and sarcine and certain other organisms grow in the retained contents. It is to be noted that none of these were found in this case.

The wasting is usually explained as being due to the mechanical interference with the function of the gastric glands, but the growth of the tumour and the secondary catarrhal processes resulting from it also play a large part. In cases of tumour elsewhere than the alimentary tract similar wasting occurs, and as in such cases the hydrochloric acid of the stomach may be diminished, it has been suggested that as the normal acid stimulus to the production of secretin in the duodenum is thus absent, there is a deficiency in the ferments of the small intestine, and so the food is not properly or sufficiently digested there.

Spread.—The mode of extension of a carcinoma of the stomach is usually by the lymphatic paths to the glands, along the lesser curvature, and up to the liver, but it may also extend locally through the stomach wall, and that is the chief method in this case. Here the tumour has originated from the glands of the mucosa in the pyloric region, and has spread inwards towards the lumen and outwards through the muscle. Having penetrated the latter, it has extended directly into the omentum where the nodular masses can be demonstrated. There

is relatively little involvement of lymphatic glands in this case, only a few round the coeliac axis showing deposits. And although the omentum has numerous secondary nodules, few have extended from it over the surface of the peritoneum. It is to be noted also that there are no secondary growths in the liver. The duodenum shows no naked-eye evidence of extension to it along the mucous membrane, although there was a large mass in the pylorus immediately adjacent. This absence of extension to the duodenum is a feature frequently to be observed. But, as shown microscopically, there had occurred infiltration of the duodenum, the largest deposit being subperitoneal, and probably by way of the adjacent affected omentum, and small secondary deposits spreading into the muscular, submucous, and mucous coats.

Tissue Reaction.—It has been noted in the sections how the tumour deposits, not only in the mucous coat of the stomach but also in the muscular coats and in the omentum, all show marked invasion by polymorph leucocytes. There is therefore evidence of a distinct inflammatory reaction of the tissues to the tumour, and it is possible that the relatively restricted growth and the absence of much lymphatic gland involvement are to be ascribed to the resistance offered by the tissues.

Types of Carcinoma.—The histological type of growth in this case is the columnar-celled carcinoma, and shows the formation of irregular acini. Other types found in the stomach are the spheroidal-celled, either in the form of "scirrhus," which may spread widely along the stomach coats and give rise to one form of "leather bottle" stomach, or of "encephaloid," which usually forms a large fungating mass. The columnar-celled carcinoma is indistinguishable from the encephaloid except histologically, and its mode of spread is very similar, viz. through the stomach wall and thence by lymphatic paths. Colloid degeneration is a common feature of all the types, but was not in evidence in this case.

This case is to be compared with * *D. B.*, 42, *M. B.*, 197, which is an adeno-carcinoma causing obstruction at the pylorus, with much dilatation of the stomach; *D. B.*, 127, *M. B.*, 99, 100, which is a spheroidal-celled carcinoma of the "scirrhus" type, with general involvement of the stomach wall and great contraction, giving the "leather bottle" appearance. *D. B.*, 181, *M. B.*, 447; *D. B.*, 269, *M. B.*, 448; *D. B.*, 555, *M. B.*, 449, are also examples of the "leather bottle" stomach.

Site of Tumour.—As regards site, the pyloric end is affected in more than half of the cases. Less common sites are the curvatures and the cardiac end; and occasionally the wall is diffusely infiltrated.

* These figures refer to relevant specimens in the teaching collection which the student is expected to study for purposes of comparison.

It should be remembered that gastric carcinomas may be superimposed on a chronic gastric ulcer, and this is to be correlated with the observed relationship between old-standing gall-stones and carcinoma of the gall-bladder; also chronic ulcers of the tongue, lips, leg, etc., may become malignant, illustrating the fact that there is a relationship between chronic irritation and the onset of cancer.

(*Vide D. B.*, 311, *M. B.*, 548, squamous epithelioma of jaw in a betelnut chewer. *D. B.*, 413, *M. B.*, 321, squamous epithelioma of leg following chronic ulcer of leg. *D. B.*, 58, *M. B.*, 136, carcinoma of gall-bladder in case of old-standing gall-stones.)

Secondary Effects.—The secondary effects of the tumour are degenerations, especially fatty degeneration, in the various organs, most prominent in the liver and kidney; and the general wasting and malnutrition of the tissues have already been referred to. In this case atrophy of the organs was the chief change; fatty degeneration, although present in the liver, was slight. The age of the patient (69) would also account to some extent for the atrophy seen.

At the operation the tumour was considered to be too extensive to admit of satisfactory removal, and also the age of the patient was against his being able to stand a radical operation. Accordingly a gastro-enterostomy was performed with the object of giving a freer passage of food from the stomach and to relieve the catarrh therein.

For a day after the operation the patient seemed to be getting on satisfactorily, but on the 2nd of November he was weak, and that night he suddenly collapsed. This leads to the consideration of his heart condition.

Heart Lesion.—Ordinary clinical examination of the heart had not shown evidence of serious cardiac disease, and the pulse, although rapid, was strong. It was only later that the fact of his having a "fainting attack" four years previously was elicited.

In the light of the pathological examination the sequence of events has been as follows:—

This man had evidently had a slowly developing arteriosclerosis, affecting chiefly his coronary arteries. Four years ago thrombosis had occurred in the descending branch of the thickened left coronary artery and caused an infarct of the heart wall towards the apex. This accounted for the "sudden fainting." Had a larger area been involved sudden death would have then resulted, but the patient survived the infarction. The damaged tissue was gradually absorbed and replaced by fibrous tissue, and, owing to the thickened coronary, the muscle for some distance around had suffered from inefficient nutrition and had undergone atrophy with secondary fibrous replacement. The apex of the heart being thus replaced by non-contractile tissue yielded to the intra-cardiac pressure and so the aneurysm formed. This being a rigid

rough-walled sac, the blood did not so readily circulate there and consequently thrombosis occurred. Such a heart was sufficient for the ordinary functions of an old man, but the fact of it having to stand the strain of an operation proved too much for it. With the gradually failing cardiac action thrombosis had occurred in the pulmonary artery, and this would further embarrass the heart and precipitate the sudden failure which occurred.

The vascular degeneration in this case has been very localised, as there is practically no change, other than what an old subject would show, in the renal or splenic vessels, or in the aorta; the coronaries appear to have been the only arteries markedly affected.

This case shows the usual site of infarct of the heart wall. It is to be compared with *D. B.*, 463, *M. B.*, 363, which is a recent one in the same situation, and which resulted in immediate sudden death.

Obstruction usually occurs in a descending branch of the left coronary, and is less frequently found in the corresponding branch of the right, in which case the infarct occurs in the septum. It is a well-recognised cause of sudden death, but, as seen in this case, recovery from the primary damage may occur, to be followed by absorption of the infarct, fibrosis, and aneurysm.

The immediate cause of death in this case was heart failure complicated by pulmonary thrombosis.

FROM THIS CASE NOTE:—1. *The Carcinoma of the Stomach*—(a) its site; (b) its naked-eye and histological characters; (c) its mode of spread; (d) the effects produced.

2. *The Aneurysm of the Heart Wall*—(a) its cause; (b) the sequence of events; (c) the effect of this lesion on the progress of the case.

For permission to publish the clinical account of this case we have to thank Mr. H. J. Stiles, F.R.C.S.E.

A. MURRAY DRENNAN.

THE LOCAL INCIDENCE OF CANCER IN FRANCE
IN RELATION TO FUEL.

By C. E. GREEN, F.R.S.E.

THE local distribution of cancer in France is very interesting. Statistics alone, however, as given by the Ministry of the Interior, do not tell their story so clearly or so well as a diagrammatic map, and three most instructive maps are given in an article in *La Presse Médicale*, 13th May 1911, by M. Bertillon. These maps show diagrammatically on each department of France small rectangles, the height of each of which is proportionate to the figure above it, which figure shows the deaths from cancer per hundred thousand inhabitants living. The shaded squares are above the average, the white squares are below. These maps are shown in Figs. 1, 2, and 3.

Fig. 1 shows the death-rate per hundred thousand inhabitants in the *country districts* for the years 1906, 1907, and 1908.

Fig. 2 shows the corresponding death-rate for the *towns* of over five thousand inhabitants.

Fig. 3 shows the towns and country districts compared for the year 1908 alone.

A glance at these maps will show that cancer is largely confined to the northern half of France.

As M. Bertillon states, if a line be drawn from La Rochelle to St. Etienne and from there to the Rhône, the square formed by this line—the Rhône, the Pyrenees, and the seas—does not contain a single department where cancer is frequent. Whereas if a square be drawn, having for its boundaries on the west the sea, and on the other side three lines going from Caen to Angers, and another from Angers to Dijon, and the third from Dijon to Mézières, in every department inside this square cancer is prevalent, the death-rate per hundred thousand inhabitants living being four or five times as great as it is in the south.

The object in preparing Figs. 1 and 2 was to show that for three years the death-rates had been fairly constant; in preparing Fig. 3, to show that, as a general rule, cancer was much more prevalent in the towns than in the country, and this can be seen at a glance. The comparative death-rate in town and country districts for the year 1908 is striking, the average per hundred thousand living being in the towns 103 deaths and in the country 62, or nearly half.

M. Bertillon seeks in vain to find an explanation for this curious distribution and for the difference between town and country.

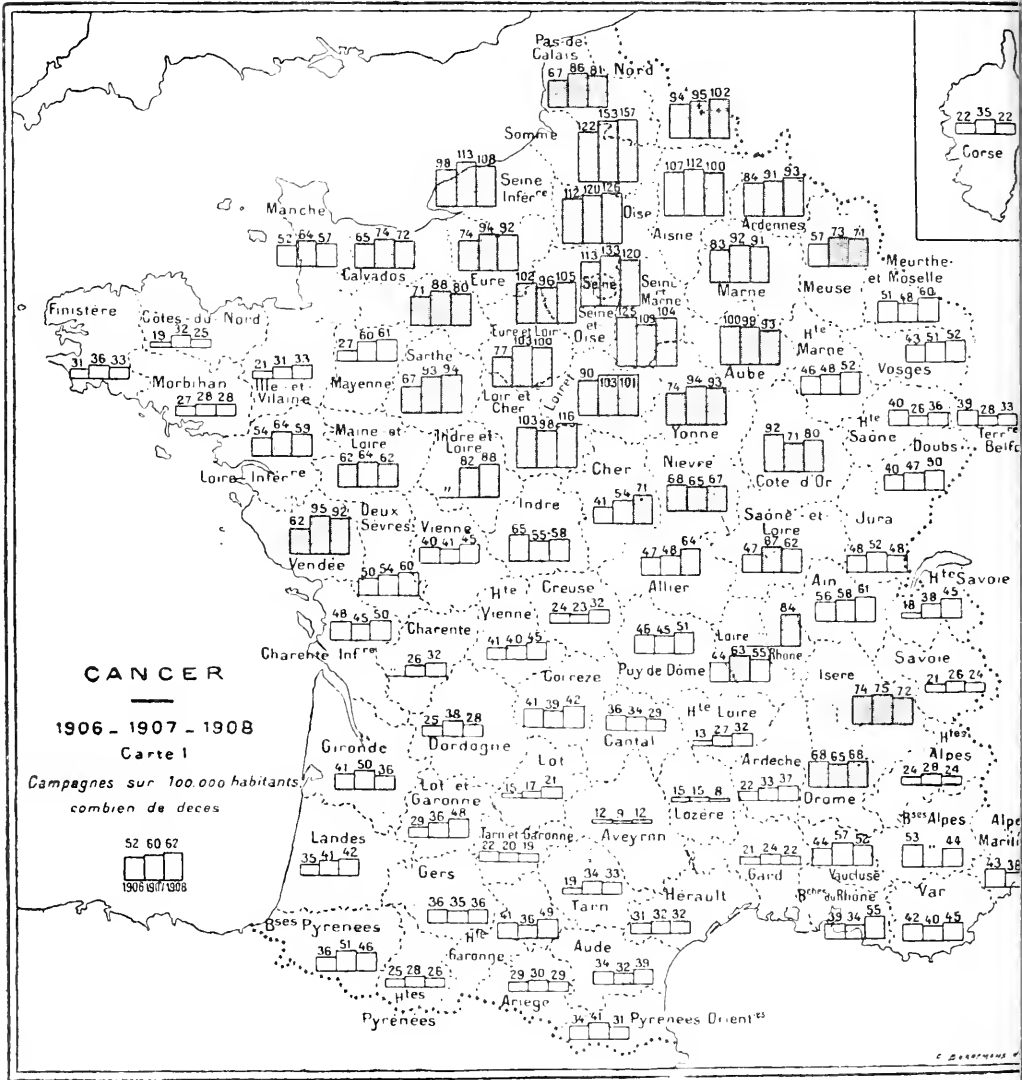


FIG. 1.

At first sight, he says, the distribution seems to follow the geological map of France, the deadly square lying in the basin of which Paris is the centre, but this cannot, he admits, apply to

The Local Incidence of Cancer in France 17

Pas de Calais, Nord, and Somme, which do not form part of the basin and yet suffer much from cancer.

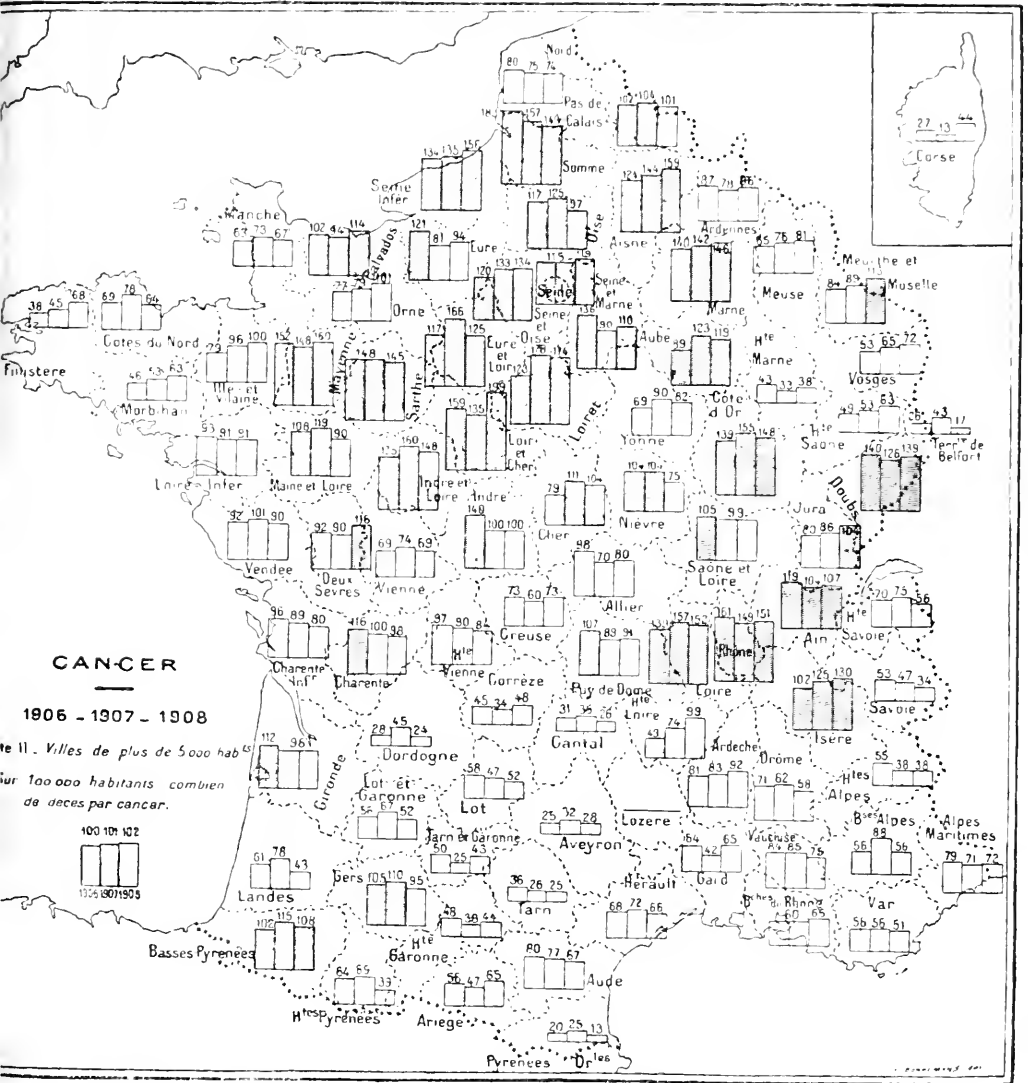


FIG. 2.

The map follows also, to some extent, he further indicates, that of the alcoholic consumption; and yet he points out that Brittany, which suffers little from cancer, has a large alcoholic consumption.

tition dans les villes est analogue, mais pourtant moins nette.

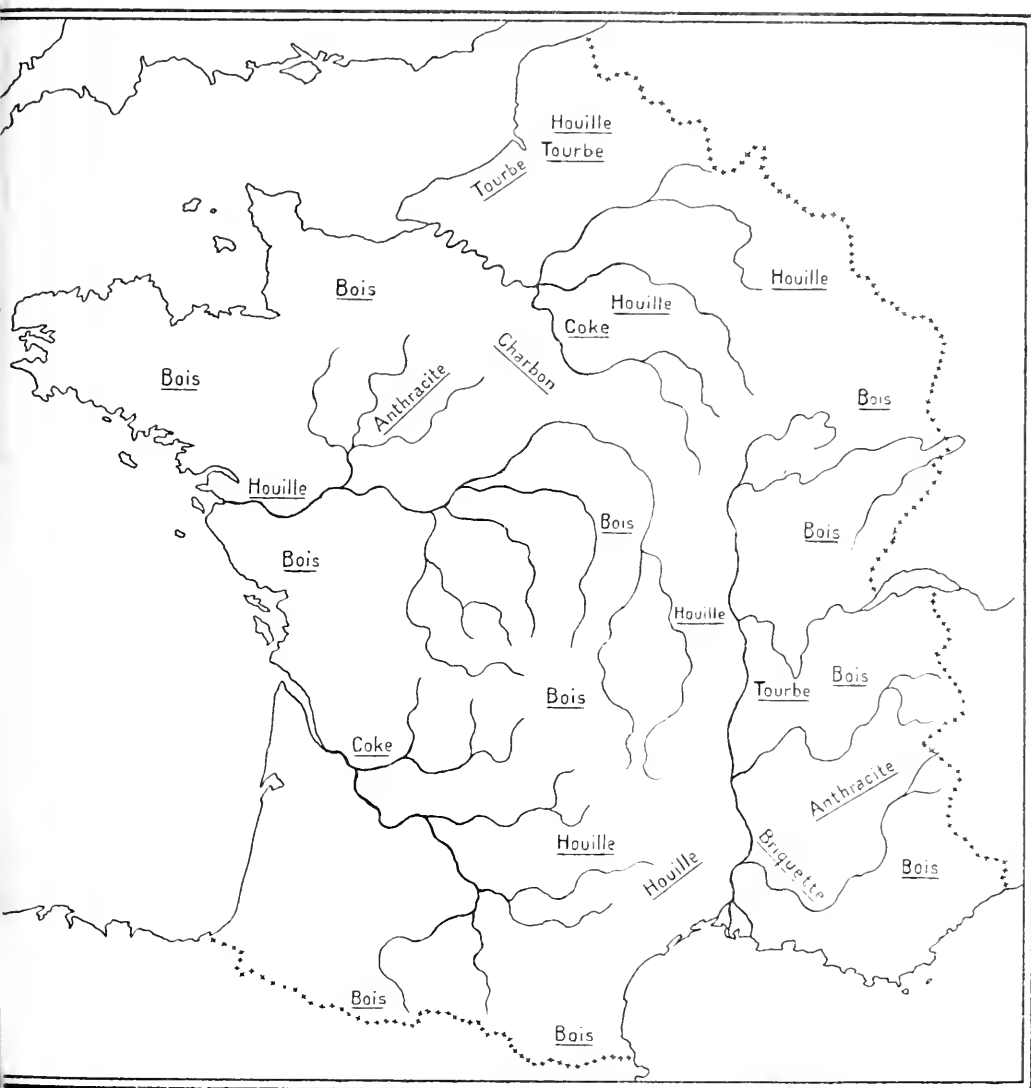


FIG. 4.

“A cette répartition dans les campagnes, il y a certainement une cause et probablement une cause unique. Cette cause, nous l’avons cherchée sans la trouver.

“Nous avons constaté l'augmentation générale de la fréquence du cancer. Nous avons vu que c'est seulement le cancer du tube digestif (cavité buccale non comprise) qui augmente de fréquence à Paris depuis trente-cinq ans et aussi à Amsterdam.

“Nous avons remarqué la rareté relative du cancer chez les Israélites en Algérie et aussi à Amsterdam.

“Peut-on rattacher quelques-uns de ces faits à l'alimentation carnée; nous l'avons cherché, sans arriver à un résultat positif.

“Que de problèmes soulevés! Que de recherches à faire.”

The problem is truly an interesting one, and, as M. Bertillon says, “Il y a certainement une cause et probablement une cause unique.”

That cause I believe to be connected with the nature of the fuel burned in the various departments, coupled with the fact that the farther one goes north the colder the country is in winter, and the more fuel must necessarily be burned.

I have already sought to show in previous papers that there is a mysterious connection between the fuel used and the cancer incidence. In Nairnshire cancer seems to be actually non-existent in the districts where nothing but a light non-sulphurous peat is burned, whereas it is very common in that part of the country where coal is used (*Edinburgh Medical Journal*, October 1912), commoner, indeed, than in any other district in Scotland.

In Orkney, again, cancer is common in a few districts where nothing but peat is burned when that peat is coal-like in character and has a very high sulphur percentage (*Edinburgh Medical Journal*, August 1913).

I felt convinced that the diagrammatic maps which are here reproduced would throw further light upon this fuel question, and have accordingly during the last year undertaken an investigation into the question of the fuel burned in each department of France. The first step I took was to get a teacher of geography in France to indicate roughly on a map the staple fuel burned in each district, and this map is shown in Fig. 4. It will be seen that where wood is the staple fuel the death-rate is low, as, for example, in Brittany, along the Pyrenees, and the Alps and Vosges Mountains. Where coal is burned, again, the death-rate is abnormally high.

This diagram, however, did not seem to me sufficiently



detailed, and I felt it was worth while writing the Préfet of each of the departments in France the following letter:—

“Depuis plusieurs années j'ai travaillé aux causes qui produisent le cancer, et j'ai trouvé, en Ecosse, une connexion mystérieuse entre son occurrence locale et la nature des matériaux employés pour le chauffage des habitations.

“Je trouve qu'en Ecosse, partout où l'on brûle du charbon, le mal est commun, mais où la tourbe ou le bois est employé il est extrêmement rare.

“Par suite de la très bonne série de statistique récemment préparée par M. Bertillon de Paris, je désirerais beaucoup accomplir une investigation de la même sorte en France. M. Bertillon montre les cas de mort dans chaque département et je tiendrais à avoir des détails concernant les combustibles employés dans chaque département de la France, ensuite, préparer une carte, montrant ces informations comparées à celles de Monsieur Bertillon.

“Auriez-vous l'obligeance de m'écrire une courte lettre me faisant savoir si c'est le charbon ou le charbon de bois, le bois ou la tourbe que l'on emploie principalement dans votre département (1) dans les campagnes, (2) dans les villes.

“Je suis fâché de vous déranger ainsi mais je pense que comme moi vous admettez que tout éclaircissement sur la cause de ce mal terrible a son extrême importance.”

I cannot sufficiently thank these gentlemen for the kindness with which they have met my request, and I venture to think that the results have been more than worth the trouble. Unfortunately some of the departments had not replied before this unfortunate war broke out, and the results are accordingly not complete, but they are quite sufficient I feel to be convincing.

I have worked out on Plate I. the first reports received from each department as follows:—Where only wood is burned this is shown by a red spot, where only coal by a black one. Where coal and wood are both used red and black spots are both shown. C. stands for charcoal, and it is surprising how little charcoal after all is burned in France as compared with coal, which is known as *houille* or *charbon de terre*. The exigencies of printing have made the reproduction of my original map somewhat difficult.

The results seem to me to be striking. In nearly all the towns some coal is burned, and this, to my mind, explains the higher death-rate in the towns, the average for the whole of France being, as has been said, 103 per hundred thousand living in the towns and 62 per hundred thousand living in the country districts. It will be seen that wherever nothing but coal is burned the town death-rate is very high; where wood and a little coal is burned the death-rates of both town and country are average; and where only wood is burned the death-rates are very much below the average.

In Brittany wood alone is burned in the country and only a little coal in the towns. The death-rate of both is much below the average. Further east, however, where only coal is burned, the death-rate is very much above the average.

Two striking instances are Loire and the Basses Pyrenees. In both cases practically only coal is burned in the town districts and only wood in the country, with the result that the town death-rate is in both cases nearly three times that of the country.

To return, however, to Brittany. It will be seen that in the western departments the death-rate in the towns is more than double that of the country, and that the fuel in the country districts is invariably wood, and wood and coal in the towns. Further south, on the seaboard, a considerable amount of coal is burned in town and country alike, whereas to the south-east practically nothing but wood is burned, with the result that the death-rate drops in both town and country with the interesting exceptions of Cantal, Aveyron and Tarn, to which I shall refer later.

Interesting as this comparative map is, I felt that it would be even more interesting were I to check these results and work them out on the two maps, showing the town and country death-rates independently of one another. This involved further correspondence in certain cases and some readjustments. The results are shown on Plates II. and III.

Where coal is practically the only fuel burned I have put a broad black line across the small rectangles. Where wood is practically the only fuel burned I have put a red line. Where both coal and wood are burned I have put a black and a red line; but in cases where I have been informed that coal is the staple fuel and wood is used only to a considerable extent, I have put the black line above the red one, and vice versâ.

To take the first of these maps (Plate I.) it will be seen that in nearly all the town districts of France coal is largely used. Wherever coal is exclusively burned it will also be noticed that the death-rate is invariably very high, as is the case also where charcoal is burned. The fact that charcoal seems to be as dangerous as coal is not surprising when it is borne in mind that in the Kangri basket, which undoubtedly causes malignant tumours in the natives of Kashmir, the fuel used is charcoal, specimens of which I have received lately by the kindness of Dr. Neve.

On the other hand, where wood is burned exclusively, as in Dordogne, Tarn, Lot, Lozère, and the Pyrenees Orientale, it will be seen that the death-rate is very low.



Interesting as the town death-rate is, the country death-rate is even more striking. The extent to which wood is burned in the country districts in France is surprising when one goes in detail into the matter, and Plate II. shows that in practically every department wood is largely employed. All the exceptions are to be found in the north, where it will be seen that the death-rate in the country districts almost approximates that of the town. Indeed, in certain of these districts the country death-rate shown on Plate I. is actually higher than the town.

The explanation of this is, to my mind, the simple one that where coal is burned, as it often is in country districts, on hearths and in grates which were originally built to burn wood, the elimination of the products of combustion of the fuel is much less effective, and the results are correspondingly deleterious.

Plate III., however, shows that where coal and wood are burned the death-rate is about the average. Where wood alone is burned the death-rate is much below the average in some cases, as in Lozère and Aveyron, less than quarter of the average.

The maps speak for themselves. There may here and there appear to be slight discrepancies, but it must be remembered that it is extremely difficult to get an inquiry such as this carried out, even at the expense of great time and trouble, with absolute mathematical precision. One cannot calculate out to a decimal point the proportions of wood and coal which are used, but I have done my best to tabulate the information which has been so kindly given me, and which varies from such a general statement as "*Indistinctement le charbon et le bois, mais principalement le bois,*" to the very elaborate statistics for which I am indebted to the Préfet of the department of the Seine. Taken generally, however, I feel convinced that the maps bear out the fact that the character of the fuel used in any particular district has a profound effect upon the incidence of cancer.

As I have said, cancer seems to be practically non-existent in some purely peat-burning districts in Scotland, whereas the death-rate is almost invariably high wherever coal is burned. It was a great surprise to me to find it very prevalent in certain districts in Orkney where nothing but peat was burned, until I learned that this peat contained nearly one per cent. of sulphur, and was coal-like in character.

The exception often proves the rule, and I venture to think that my present study of the cancer incidence of France has proved the truth of the old adage. It will be noticed in Plate I.

that in the south of France the departments of Cantal and Aveyron burn almost exclusively coal in the towns. The Préfet of Cantal writes as follows:—

“Le charbon de terre est habituellement employé comme combustible dans les villes et le bois dans les campagnes.”

The Préfet of Aveyron writes:—

“1. Dans les campagnes: le bois presque exclusivement.

“2. Dans les villes le houille.”

This, at first sight, seemed to me unaccountable in view of the other results, but the Préfet of Cantal most kindly agreed to send me specimens of the coal used for domestic purposes in the district. This coal, like the Orkney peat, was a surprise.

It is a beautiful, hard, glistening, jet-like substance, apparently without any impurities such as pyrites, and totally unlike the coal which we are accustomed to. On analysis it showed the same sulphur content as the peat from Nistaben and Ardclach in Nairnshire, where cancer is very rare, viz. one death out of forty-two from all causes.

Some other element than the strictly sulphur content may be involved in the relationship of certain fuels to the cancer death-rates of the districts in which they are used. Some chemical condition of the fuel, its ash, or its other products of combustion may be responsible, but the results of such inquiries as I have made into the fuel conditions of those districts where cancer is rife seem to me to point conclusively to the fact that the etiology of malignant disease has some subtle connection with fuel and its products of combustion, a connection which lies somewhere about the difference between wood and charcoal, and between the coal of Aveyron and Cantal and that of the north of France.

THE SANATORIUM TREATMENT OF PULMONARY
TUBERCULOSIS AND ITS RESULTS.

By JOHN GUY, M.D.

WHEN I first began the sanatorium treatment of tuberculosis the system of forced feeding had generally passed into disuse, although in several quarters it still lingered as a sort of bad example.

Several of the staff had been in the sanatorium during that period, and had amazing tales to tell of the wonderful capacity of some patients to consume food—amazing tales of their perseverance—how a patient would rise from the dining-table and make a retreat to the lavatory and there empty the stomach and come back to the dining-table to fill it up again.

The stories as to the amount of weight that some of the patients put on were also wonderful. The sanatorium had been founded by the well-known philanthropist, Mr. Quarrier, and when the female patients took their walks abroad, what with clothes and adipose tissue their girth was so noteworthy that the country people around, in their homely country language, spoke of them as "Quarrier's Fat Women." The stories told of the rapid descent downward to the grave of the patients after leaving the sanatorium were equally startling.

The period of forced feeding had just passed, and the days of estimations of nitrogen intake, of the caloric value of food, were in full swing. Looking back now, one wonders at the amount of energy that was put into calculating the exact caloric value of the various articles of food consumed and of the various stratagems by which the fuel value of the diet was brought to correspond to 2999.5 calories.

Although I am not sure that much impression was made on the course of the disease by the most elaborately calculated diet. I have never forgotten the lessons then learned in the various food values of the different articles consumed. In the end the conclusion come to was that an ordinary diet with a little extra butter was the most beneficial for the patients.

Finding that other things must be tried in addition to a careful scientific diet, I directed my attention to some therapeutic agents.

Creosote was among the earliest, and was given internally with increasing doses, but the only result I could see was that much dyspeptic trouble was caused.

Succinamide of mercury was tried hypodermically, but it was painful, and at times caused some ulceration of the skin if the injection was not given deep enough, and as no apparent effects were produced on the lung process, it was also given up.

Intra-laryngeal injections of menthol, etc., were tried, but without apparent good result. In many of the cases the amount of sputum was increased; in some, troublesome cough was greatly alleviated. Looking back, it is difficult to see how this could influence the disease. Another substance which I tried intra-laryngeally was a preparation somewhat analogous to "606." Dr. L. Findlay of Glasgow had received it from Professor Ehrlich, and he found that by injecting a solution into the larynx of a rabbit which he had infected in the same fashion with an emulsion of tubercle bacilli, no growth took place in the lungs of the rabbit, provided that the remedy was used within three days of the date of infection. A prolonged trial proved, however, that it had no influence on the human subject.

Intravenous injections of iodoform after Dewar's method were largely tried, but I was convinced that in the series of cases treated no good accrued.

Continuous inhalations of antiseptics also received an extended trial, the patients ultimately wearing the masks practically continuously for twenty-four hours. In two cases there was a most remarkable drop in the temperatures within a few days of beginning the treatment, but whether this was mere coincidence or not I was unable to state. The fact, however, was most noteworthy. I was unable to determine the effect of the treatment on the micro-organism other than the tubercle bacillus, but on this latter, as far as I could judge, no effect took place.

One case was very interesting—that of a woman with a particularly offensive odour in her breath, strongly suggestive of a gangrenous cavity, but with no physical or other signs to confirm this. She was put on continuous inhalations, and in the course of a few weeks the smell disappeared. I have ever since regretted that I did not discharge her at once, as I should have been able to boast for the rest of my natural life of the marvellous effects in one case at least of antiseptic inhalations. Unfortunately, however, the patient was kept in residence, and fortunately the inhalations were not discontinued, but in a very few days the odour returned and did not disappear again despite prolonged treatment. Appended is a list of cases treated.

CONTINUOUS INHALATIONS.

No.	Length of Treatment.	Sputum.		T. B.		Temperature.		Lungs.		
		B. foc.	After.	Before.	After.	Before.	After.	Before.	After.	
1. T. M.	11½ wks.	5XXIV.	5XXVI.	+	A few.	99.8	99	Int.	R. lung.	Creps. as before. No apparent change.
2. H. S.	11 "	5XXX.	5XXXIII.	+	A few.	99.6	99.8	Int.	Creps. dry.	No apparent change.
3. H. J.	12 "	5XXV.	5XIV.	+	Numerous.	98.4	99.2	Int.	Creps. all over l. lung.	Creps. as numerous, but dry.
4. D. R.	8 "	5XV.	5XV.	+	Nil.	98.4	98.4	Early.	Creps. Apex of up, and l. r. lobes.	Creps. very few.
5. W. K.	9 "	Nil.	Nil.	+	Nil.	98.6	98.4	Int.	Creps. numerous, r. and l. lungs.	No apparent change.
6. G. F.	21 "	5XXII.	5XXII.	A few.	Scattered.	100	99.8	Int.	Creps. numerous, both lungs.	No apparent change.
7. J. D.	10 days.	5XIII.	5XVI.	A few.	Scattered.	99	98.8	Int.	Creps. numerous, both lungs.	No apparent change.
8. W. T.	8 wks.	5XIII.	5VI.	+	A few.	100	98.6	Int.	Creps. numerous, both lungs.	No apparent change. Marked lowering of temp.
9. W. C.	3 "	5XXXIII.	...	A few.	...	98.4	...	Int.	Creps. numerous, both lungs.	No apparent change.
10. A. M.	8 "	5II.	5XI.	+	Teeming.	99.4	100	Early.	Very few creps.	Disease advancing rapidly.
11. R. M. C.	12 "	5X.	5X.	+	Scattered.	99	98.8	Early.	Few creps, l. apex.	Lung appears better.
12. J. M. C.	12 "	5VII.	5V.	+	Numerous.	98.6	98.6	Int.	Creps. numerous, r. lung.	Creps. faint and dry. Disease stationary.
13. J. H.	10 "	5V.	5VI.	Nil.	Scattered.	98.4	98	Early.	Creps. Apex r. up. lobe.	Very few creps.
14. R. C.	9 "	5XXV.	5XXXVI.	A few.	...	99	99	Int.	Creps. numerous, both lungs.	No apparent change.
15. A. G.	12 "	5II.	5II.	+	...	98.4	99.2	Early.	Creps. r. up. lobe. Apex l. r. lobe.	No apparent change.
16. H. O.	16 "	5XV.	5VIII.	A few.	Scattered.	99.6	99.2	Int.	Creps. numerous over both lungs.	No apparent change.
17. J. M. P.	12 "	5XI.	5VI.	Very Numerous.	Scattered.	104.4	100.8	Int.	Creps. few, r. lung.	No apparent change.
18. A. M. C.	3 "	5X.	5V.	A few.	Several.	99.4	99.4	Early.	Creps. r. and l. lungs.	Creps. chiefly confined to r. lung. States dyspnoea, and cough much less.
19. L. C.	8 "	5XIII.	5XII.	Scattered.	A few.	99	98.8	Int.	Creps. numerous, l. lung. Apex r.	Creps. dry, otherwise unchanged.
20. J. M. L.	7 "	5XI.	5VIII.	Scattered.	Very few.	101	99	Int.	Creps. numerous, l. lung. Apex r.	Creps. few dry (tem. and gen. cond. better).
21. H. M.	8 "	5XXVI.	5XXXII.	Scattered.	Few.	100.4	98.6	Adv.	Creps. numerous, both lungs.	No apparent change (tem. and gen. cond. better).
22. G. F.	20 "	5II.	5III.	Teeming.	Numerous.	99.8	99.8	Int.	No creps. R. M. weak, r. lung.	No apparent change.
23. S. M. M.	8 "	5XXXIII.	5XX.	Scattered.	Few.	100.4	97.8	Int. Adv.	Creps. numerous, both lungs.	No apparent change (temp. much lower).
24. Mrs. M. C.	3 "	5VIII.	5XVIII.	Teeming.	Scattered.	...	99.6	Int.	Creps. numerous, l. lung.	No apparent change.
25. M. M. O.	9½ "	5XV.	5XVII.	+	Scattered.	99	100	Early.	Creps. Apex r. up, and l. lobes.	No apparent change.

Raw meat treatment (zomotherapy) was extensively tried. While it was advocated strongly as a remedy that might work wonders even in extreme cases, I did not form any specially favourable opinions regarding it.

My senior assistant at that time, Dr. Davidina Davidson, was indefatigable in her blood examinations, but in a series of 100 cases we were unable to convince ourselves of any very remarkable increase of the corpuscles element or haemoglobin. That there was an increase of the latter was undoubted, but there always was so under the ordinary conditions of the sanatorium life.

The number of patients who were infected by *tœnia medio-canellata* was quite sufficient for me to feel I was on safe ground in stopping raw meat treatment, and impressed me with the idea that our meat supply was more infected than is generally supposed. Only the best and most expensive part of the animal was used for raw meat.

Tuberculin treatment was consistently tried for years. The oral method was soon discarded as useless.

Tuberculin was then given once in ten or fourteen days by what might be called the infinitesimal dosage system, but as I saw no more effect than by giving it orally, this, too, was given up. What is known as the German method was tried extensively, and all forms of tuberculin were used. In a paper read before the Glasgow Medico-Chirurgical Society, I stated that a small series of cases carefully gone into seemed to prove a slight balance in favour of tuberculin. The balance was so slight, however, that in view of the fact of the selection of the cases for tuberculin, it seemed to me that it would have been better to have stated the case as "Not proven." A much more extended practical study of about three years has not modified my opinion.

Tuberculin as a diagnostic agent was tried extensively. Pirquet's and the other cutaneous methods are quite useless when they give a positive reaction. When given subcutaneously, the only point worthy of notice is the focal reaction, and this means, so it appears to me, that there is a tuberculous lesion at that point, but as to its activity the focal reaction gives no guide.

Results.—It is always difficult to draw conclusions, and I am not sure that the following figures will prove anything, except that it is extremely difficult to estimate the value of sanatorium treatment. I should like to state, however, that the manifest

change in the patient's condition during the first month or two of residence in the sanatorium was an ever-recurring marvel to me.

The classification adopted was as follows:—

I. TYPE OF CASE ON ADMISSION.—*Incipient* (favourable).—Slight initial lesion in the form of infiltration limited to the apex or a small part of one lobe. No tuberculous complications. Slight or no constitutional symptoms (particularly including gastric or intestinal disturbances or rapid loss of weight). Slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours, especially after rest. Expectoration usually small in amount or absent. Tubercle bacilli may be present or absent.

Moderately Advanced.—No marked impairment of function, either local or constitutional. Localised consolidation moderate in extent, with little or no evidence of destruction of tissue; or disseminated fibroid deposits. No serious complications (tuberculous).

Far Advanced.—Marked impairment of function, local and constitutional. Localised consolidation intense; or disseminated areas softening; or serious complications (tuberculous).

II. CONDITION ON DISCHARGE.—*Progressive* (unimproved).—All essential symptoms and signs unabated or increased.

Improved.—Constitutional symptoms lessened or entirely absent; physical signs improved or unchanged; cough and expectoration with bacilli usually present.

Arrested.—Absence of all constitutional symptoms; expectoration and bacilli not present: the foregoing conditions to have existed for at least two months; the physical signs to be those of a healed lesion.

In this group the years 1907 to 1911 inclusive are given.

The inquiry was annual, and the results in March 1912 are given.

Analysis in 1912 of 1907.

		Well.	Not Well.	Dead.	Untraced.
Early	76				
Disease arrested	56	15	1	6	34
Improved	14	3	1	2	8
Progressive	6	...	...	4	2
	—	—	—	—	—
	76	18	2	12	44
	—	—	—	—	—

		Well.	Not Well.	Dead.	Untraced.
Moderately advanced	117				
Disease arrested	23	2	...	2	19
Improved	48	2	1	25	20
Progressive	46	...	...	42	4
	<u>117</u>	<u>4</u>	<u>1</u>	<u>69</u>	<u>43</u>
Far advanced	33				
Disease arrested . . . . .	...	...	...	...	...
Improved	10	...	...	8	2
Progressive	23	...	...	19	4
	<u>33</u>	<u>...</u>	<u>...</u>	<u>27</u>	<u>6</u>
	<u>226</u>	<u>22</u>	<u>3</u>	<u>108</u>	<u>93</u>

Analysis in 1912 of 1908.

		Well.	Not Well.	Dead.	Untraced.
Early	95				
Disease arrested	66	18	6	4	38
Improved	24	3	1	4	16
Progressive	5	...	...	4	1
	<u>95</u>	<u>21</u>	<u>7</u>	<u>12</u>	<u>55</u>
Moderately advanced	139				
Disease arrested	33	6	4	7	16
Improved	48	3	1	19	25
Progressive	58	1	...	45	12
	<u>139</u>	<u>10</u>	<u>5</u>	<u>71</u>	<u>53</u>
Far advanced	55				
Disease arrested	1	...	...	...	1
Improved	15	1	1	4	9
Progressive	39	...	...	28	11
	<u>55</u>	<u>1</u>	<u>1</u>	<u>32</u>	<u>21</u>
	<u>289</u>	<u>32</u>	<u>13</u>	<u>115</u>	<u>129</u>

Analysis in 1912 of 1909.

		Well.	Not Well.	Dead.	Untraced.
Early	91				
Disease arrested	63	27	4	4	28
Improved	26	5	4	7	10
Progressive	2	...	...	...	2
	<u>91</u>	<u>32</u>	<u>8</u>	<u>11</u>	<u>40</u>

		Well.	Not Well.	Dead.	Untraced.
Moderately advanced.	170				
Disease arrested	15	1	1	3	7
Improved	81	7	6	30	31
Progressive	71	1	...	58	12
	<u>170</u>	<u>9</u>	<u>10</u>	<u>91</u>	<u>60</u>
Far advanced	57				
Disease arrested	1	...	...	...	1
Improved	10	1	1	5	3
Progressive	46	...	...	42	4
	<u>57</u>	<u>1</u>	<u>1</u>	<u>47</u>	<u>8</u>
	<u>318</u>	<u>42</u>	<u>19</u>	<u>149</u>	<u>108</u>

Analysis in 1912 of 1910.

		Well.	Not Well.	Dead.	Untraced.
Early	85				
Disease arrested	50	24	5	...	21
Improved	31	4	2	7	18
Progressive	4	...	...	4	...
	<u>85</u>	<u>28</u>	<u>7</u>	<u>11</u>	<u>39</u>
Moderately advanced.	169				
Disease arrested	31	14	4	2	11
Improved	91	19	5	27	40
Progressive	47	...	1	39	7
	<u>169</u>	<u>33</u>	<u>10</u>	<u>68</u>	<u>58</u>
Far advanced	80				
Disease arrested	2	...	...	1	1
Improved	25	1	1	12	11
Progressive	53	2	...	39	12
	<u>80</u>	<u>3</u>	<u>1</u>	<u>52</u>	<u>24</u>
	<u>334</u>	<u>64</u>	<u>18</u>	<u>131</u>	<u>121</u>

Analysis in 1912 of 1911.

		Well.	Not Well.	Dead.	Untraced.
Early	132				
Disease arrested	63	49	5	...	9
Improved	67	37	8	6	16
Progressive	2	1	1	...	...
	<u>132</u>	<u>87</u>	<u>14</u>	<u>6</u>	<u>25</u>

		Well.	Not Well.	Dead.	Untraced.
Moderately advanced .	156				
Disease arrested . . .	10	6	2	...	2
Improved	118	40	39	23	16
Progressive	28	2	3	21	2
	<u>156</u>	<u>48</u>	<u>44</u>	<u>44</u>	<u>20</u>
Far advanced	67				
Disease arrested . . . .	...	...	...	...	...
Improved	38	7	9	13	9
Progressive	29	...	2	22	5
	<u>67</u>	<u>7</u>	<u>11</u>	<u>35</u>	<u>14</u>
	<u>355</u>	<u>142</u>	<u>69</u>	<u>85</u>	<u>59</u>

Taking a résumé of the five years, the condition of the patients in March 1912 was:—

Year.	No. of Patients.	Well.	Not Well.	Dead.	Untraced.
1907	226	22	3	108	93
1908	289	32	13	115	129
1909	318	42	19	149	108
1910	334	64	18	131	121
1911	355	142	69	85	59
Total	1522	302	122	588	510
		or 19·8 %	or 8 %	or 38·6 %	or 33·5 %

I personally admitted the majority of these cases, and over a limited period, during which I kept a record, there were at least 20 per cent. of applicants rejected as being too ill to have even a chance of recovery.

Another group of cases is shown here which were sent to the sanatorium by the Paisley Association for the Prevention of Tuberculosis. The cases were selected by the medical officer for the Association and sent to me for treatment. Practically all of them lived in Paisley. The cases were all inquired into personally in June and July 1910, and the results shown. The classification here is similar to that used in the last group of cases, except that in this group, under "Disease Arrested," there are included cases where the tubercle bacilli might be present on discharge.

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1904.		Well.	Not Well.	Dead.	Untraced.
Early	0				
Moderately advanced	4				
Disease arrested
Improved	2	...	1	...	1
Progressive	2	...	1	..	1
Far advanced	0				
	<u>4</u>	<u>...</u>	<u>2</u>	<u>...</u>	<u>2</u>
1905.					
Early	4				
Disease arrested	3	1	...	2	...
Improved	1	...	...	...	1
Progressive . . . . .	...	..	...	...	...
	<u>4</u>	<u>1</u>	<u>...</u>	<u>2</u>	<u>1</u>
Moderately advanced	12				
Disease arrested	4	1	1	2	...
Improved	5	...	...	3	2
Progressive	3	...	...	1	2
	<u>12</u>	<u>1</u>	<u>1</u>	<u>6</u>	<u>4</u>
Far advanced	5				
Disease arrested . . . . .	...	...	...	...	...
Improved	3	...	1	2	...
Progressive	2	...	1	1	...
	<u>5</u>	<u>...</u>	<u>2</u>	<u>3</u>	<u>...</u>
	<u>21</u>	<u>2</u>	<u>3</u>	<u>11</u>	<u>5</u>
1906.					
Early	3				
Disease arrested	2	2	...	...	...
Improved	1	...	...	...	1
Progressive . . . . .	...	...	...	...	...
	<u>3</u>	<u>2</u>	<u>...</u>	<u>...</u>	<u>1</u>
Moderately advanced	19				
Disease arrested	11	5	1	3	2
Improved	4	...	...	4	...
Progressive	4	...	...	4	...
	<u>19</u>	<u>5</u>	<u>1</u>	<u>11</u>	<u>2</u>

		Well.	Not Well.	Dead.	Untraced.
Far advanced	7				
Disease arrested	1	...	...	...	1
Improved	4	...	2	2	...
Progressive	2	...	...	2	...
	—	—	—	—	—
	7	...	2	4	1
	—	—	—	—	—
	<u>29</u>	<u>7</u>	<u>3</u>	<u>15</u>	<u>4</u>
1907.					
Early	5				
Disease arrested	4	4	...	...	...
Improved	1	...	1	...	...
Progressive . . . . .	..	...	...	...	...
	—	—	—	—	—
	5	4	1	...	...
	—	—	—	—	—
Moderately advanced	13				
Disease arrested	6	2	...	2	2
Improved	5	1	1	3	...
Progressive	2	...	...	1	1
	—	—	—	—	—
	13	3	1	6	3
	—	—	—	—	—
Far advanced	9				
Disease arrested	2	...	...	1	1
Improved	3	...	...	3	...
Progressive	4	...	...	4	...
	—	—	—	—	—
	9	...	...	8	1
	—	—	—	—	—
	<u>27</u>	<u>7</u>	<u>2</u>	<u>14</u>	<u>4</u>
1908.					
Early	1				
Disease arrested	1	1	...	...	...
Improved . . . . .	...	...	...	...	...
Progressive . . . . .	...	...	...	...	...
	—	—	—	—	—
	1	1	...	...	...
	—	—	—	—	—
Moderately advanced	19				
Disease arrested	3	2	1	...	...
Improved	10	1	2	7	...
Progressive	6	...	...	6	...
	—	—	—	—	—
	19	3	3	13	...
	—	—	—	—	—

		Well.	Not Well.	Dead.	Untraced.
Far advanced	7				
Disease arrested . . . . .	...	...	...	...	...
Improved	1	...	...	1	...
Progressive	6	...	...	6	...
	7	...	...	7	...
	<u>27</u>	<u>1</u>	<u>3</u>	<u>20</u>	<u>...</u>
1909.					
Early	1				
Disease arrested . . . . .	...	...	...	...	...
Improved	1	1	...	...	...
Progressive . . . . .	...	...	...	...	...
	1	1	...	...	...

Moderately advanced	12				
Disease arrested	1	...	1	...	...
Improved	7	3	1	3	...
Progressive	4	...	...	4	...
	12	3	2	7	...

Far advanced	1				
Disease arrested . . . . .	...	...	...	...	...
Improved	1	...	1	...	...
Progressive	3	...	...	3	...
	4	...	1	3	...
	<u>17</u>	<u>4</u>	<u>3</u>	<u>10</u>	<u>...</u>

Taking a résumé of these Paisley figures, the results in July 1910 are:—

Year.	No. of Patients.	Well.	Not well.	Dead.	Untraced.
1904	4	...	2	...	2
1905	21	2	3	11	5
1906	29	7	3	15	4
1907	27	7	2	14	4
1908	27	4	3	20	...
1909	17	4	3	10	...
	<u>125</u>	<u>24</u>	<u>16</u>	<u>70</u>	<u>15</u>
		or 19·2	or 12·8	or 56	or 12

The percentage of deaths here is heavy, but, speaking generally, a poorer type of case was sent.

Another group of cases is shown below, namely, the years 1900 to 1906 inclusive. This inquiry was an isolated one in the beginning of the year 1907. The figures for 1905 are unfortunately omitted. The majority of these cases were treated by my esteemed friend and predecessor, Dr. Hyslop Thompson.

The classification on discharge in those days was somewhat different, but the words are self-explanatory. A serious error at the time of the inquiry was to omit to note the condition on admission of the patients.

Year.	Condition on Discharge.	Present Condition.									
		Well.	Relapsed.	Dead.	Untraced.						
1900 and 1901.	Well	32	16	1	2	13					
	Cured										
	Apparently cured										
	Almost well						52	12	1	7	32
	Very much improved						129	13	1	57	58
Slightly improved											
In same state	10	...	...	6	4				
	<u>223</u>	<u>41</u>	<u>3</u>	<u>72</u>	<u>107</u>						

Year.	Condition on Discharge.	Present Condition.									
		Well.	Relapsed.	Dead.	Untraced.						
1902.	Well	40	16	1	2	21					
	Cured										
	Apparently cured										
	Practically well						66	13	1	15	37
	Almost well										
	Very much improved						107	5	1	38	63
Slightly improved											
In same state	14	...	...	5	9				
	<u>227</u>	<u>34</u>	<u>3</u>	<u>60</u>	<u>130</u>						

Year.	Condition on Discharge.	Present Condition.									
		Well.	Relapsed.	Dead.	Untraced.						
1903.	Well	39	16	1	3	19					
	Cured										
	Apparently cured										
	Practically well						46	16	1	6	23
	Almost well										
	Very much improved						85	6	3	38	38
	Slightly improved										
Improved	22	...	...	10	12				
In same state											
	<u>192</u>	<u>38</u>	<u>5</u>	<u>57</u>	<u>92</u>						

Year.	Condition on Discharge.	Present Condition.			
		Well.	Relapsed.	Dead.	Untraced.
1901.	Apparently cured	8	...	6	14
	Practically well	9	1	8	17
	Disease arrested				
	Very much improved	3	2	27	43
	Slightly improved				
	Improved				
In same state	21	...	10	11	
	<u>159</u>	<u>20</u>	<u>3</u>	<u>51</u>	<u>85</u>

Year.	Condition on Discharge.	Present Condition.			
		Well.	Relapsed.	Dead.	Untraced.
1906.	Apparently cured	16	...	2	7
	Relatively cured				
	Disease arrested	17	4	7	9
	Greatly improved	18	4	24	10
	Much improved				
	Improved				
Not improved	23	...	18	5	
	<u>141</u>	<u>51</u>	<u>8</u>	<u>51</u>	<u>31</u>

Taking a résumé of the six years, the condition of the patients in 1907 was:—

Year.	No. of Patients.	Well.	Relapsed.	Dead.	Untraced.
1900 and 1901	223	41	3	72	107
1902	227	34	3	60	130
1903	192	38	5	57	92
1904	159	20	3	51	85
1906	141	51	8	51	31
Total	<u>942</u>	<u>184</u>	<u>22</u>	<u>291</u>	<u>445</u>
		or 19·5	or 2·3	or 30·9	or 47·2

In my annual report for 1908 I spoke as follows:—"Typhus was not eradicated by the erection of fever hospitals, nor is it to be expected that consumption can be stamped out by the erection of a few sanatoria." With a few more years of added experience, and with sanatoria springing up all over the land, I see no reason to alter the above statement.

CLINICAL RECORDS.**TWO CASES OF OTITIC EXTRADURAL ABSCESS.**

By J. S. FRASER, F.R.C.S.

EXTRADURAL abscess is the commonest of the intracranial complications following suppurative otitis media. The majority of cases of septic sinus thrombosis and brain abscess are preceded by a collection of pus between the bone and the dura mater. Extradural abscess also forms the preliminary stage in many cases of otitic leptomeningitis, though purulent labyrinthitis is probably a more common precursor of this complication. Extradural abscess may occur in acute or chronic suppurative otitis media, but is more common in the former variety. In operating on cases of mastoiditis it is very common to find an area of dura mater exposed in the wall of the antral cavity, but the term "extradural abscess" can hardly be applied to this condition. It should be reserved for cases in which there is a definite collection of pus between the dura mater and the bone, with only a narrow channel of communication between the abscess and the antrum. In many cases, however, no such channel can be seen, even on careful naked-eye examination.

Very frequently the condition is not diagnosed before operation, but symptoms suggestive of the condition are: (1) Localised headache; (2) fever; (3) localised tenderness, especially over the posterior border of the mastoid process. The presence of fever is important, as we know that mastoiditis alone very seldom gives rise to a temperature of over 100° Fahr. except in very young children or in cases associated with infectious fevers.

Extradural abscesses vary very greatly in size. When opened, the pus flows out in a markedly pulsating manner. The affected dura mater may appear almost normal, or may be covered with reddish, "healthy" granulations (pachymeningitis), or may appear greyish brown or greenish and sloughy. The dura appears to be remarkably resistant to infection.

Extradural abscess may affect the middle or posterior cranial fossa. In the former case the infection passes through the roof of the tympanic cavity or antrum, whereas in the latter the disease spreads through the posterior wall of the mastoid antrum. Extradural abscesses are rarer in the middle fossa and the prognosis is less serious, although the condition may be followed by temporo-sphenoidal abscess or, less commonly, by meningitis. The posterior fossa is the more common site. Here the condition may be followed by sigmoid sinus phlebitis, cerebellar abscess, or leptomeningitis. The condition here is so serious that it is advisable to expose the sigmoid sinus just below the upper knee in any case of mastoiditis in which fever is present

before operation. If an extradural abscess be present and this procedure be not followed, operation is extremely likely to result in the spread of infection to the sinus or to the posterior fossa.

The symptoms arising from extradural abscess in the middle fossa are not well marked, but may resemble those of temporo-sphenoidal abscess. In other cases the pus may track forwards and inwards along the upper surface of the petrous pyramid and superior petrosal sinus, and give rise to paralysis of one or more of the oculo-motor nerves, as in cases recently recorded by Westmacott (*Journal of Laryngology*, October 1914) and Wilkinson (*ibid.*, No. 8, 1914).

The two following cases show the symptoms that may arise from extradural abscess in the posterior fossa. In one case the symptoms closely resembled those of septic thrombosis of the sigmoid sinus, and in the other those of basal leptomeningitis.

CASE I.—G. P., male, aged 7 years, had discharge from the right ear for several years following whooping-cough. The boy was admitted to the medical wards of Leith Hospital. On 22nd June 1914 his mother stated that for a week before admission he had been off his food and had complained of pain in the right ear. The pain was not so severe as to cause him to cry or to prevent sleep. There was no tinnitus or giddiness, but the boy was inclined to be drowsy. On 21st June (day before admission) he vomited. On 24th June the patient was seen by the writer for the first time.

Examination showed a large dry scar in the left tympanic membrane. The right external meatus contained pus; after syringing, cholesteatoma was seen at the inner end of the right meatus. There was no mastoid tenderness, and no swelling in the neck. Functional examination of the cochlear and vestibular apparatus was not successful, on account of the age and disposition of the patient. There was no spontaneous nystagmus. Ethyl chloride was given by inhalation, and lumbar puncture was performed. The fluid was under great tension, but was quite clear. No growth was obtained on culture. On the 25th June a rigor occurred, the temperature rising to 104° and the pulse to 126.

26th June 1914. — Radical mastoid operation. Usual curved incision in hair margin behind the right ear; cortex normal; mastoid process diploetic: very little pus in antrum. On removing the bone posteriorly, between the mastoid antrum and the sigmoid sinus, a large extradural perisinus abscess was found. Healthy red granulations were, however, seen on the anterior wall of the sinus. The radical operation was completed. The attic contained cholesteatoma, and the lower part of the tympanic cavity was full of granulations. (In view of the soft condition of the sinus and the healthy appearance of the granulations on its anterior wall, and in spite of the occurrence of one rigor, it was decided not to open the sinus or to ligature the

jugular, but to wait and see if rigors recurred or if the temperature rose to over 100° F. on two successive nights.) The vestibular apparatus was tested with the patient under chloroform, the application of cold lotion to the inner wall of the operation cavity causing marked conjugate deviation of the eyes to the opposite side, thus proving that the vestibular apparatus was healthy. The cavity was packed with iodoform worsted, but no stitches were inserted.

27th June 1914.—Temperature rose to 104° F. last night after operation, and pulse to 128. This morning the temperature is 98° and the patient looks well. The tongue, however, is dry and furred. Patient mentally bright. No vomiting or nystagmus. Suspicion of Kernig's sign; Babinski negative. Movements of head and neck free. Co-ordination good.

29th June 1914.—Temperature subnormal; pulse 60 to 68. Patient has had a good night and takes food well. No vomiting. Tongue a little furred, but more moist. Ethyl chloride given and wound dressed. Cavity looks well and shows reaction, accordingly five stitches inserted to close incisions; small gauze drain inserted at lower end of wound. Operation cavity packed through the enlarged meatus with iodoform gauze.

30th June 1914.—Doing well, and very hungry.

Boy made an uninterrupted recovery, and the wound healed without further trouble. The patient left the hospital on the 15th of July. At the present time the mastoid cavity is quite healed.

Remarks.—The case was one of extradural perisinus abscess. There may have been some thrombosis in the sigmoid sinus, but the progress of the case after operation shows that when a perisinus abscess is found at operation with healthy granulations on the sinus—even after the occurrence of a rigor—it may be wise not to proceed at once to open the sinus, but to wait developments. The rise of temperature to 104° following the operation—had it been repeated on two successive nights—would have called for investigation of the contents of the sinus. The single rise of temperature in a child of seven years may possibly have been due to septic absorption following the operative interference.

CASE II.—G. L., male, aged 9 years, suffered from earache and discharge from the right ear two years ago. Since that time he has had no ear trouble till the present illness commenced. The patient caught cold on 4th February 1914. This was followed by pain in both ears, accompanied by pain and stiffness in the neck. The pain was so severe as to interfere with sleep. The ears were syringed without benefit. On the following day the ears began to discharge and the pain got less, but on the 14th of February the earache recurred and was followed by pain in the neck and back. A vague history of shivering at this time was obtained, but there was no vomiting.

The patient was admitted to the surgical wards of the Royal Infirmary on 16th February. It was then found that a muco-purulent discharge was present in the right ear, along with tenderness at the tip of the right mastoid process. There was no oedema or displacement of the auricle. It was noted that the patient moved his whole body round when requested to look to one side, and that tenderness was present over the cervical spine. Between the 15th and 18th February the temperature rose each evening to 100° to 102° F. The patient, however, slept well. On 18th February the writer was asked to see the patient, as his condition was obviously due to ear disease. The boy looked pale and ill. The tongue was furred but not dry. The patient lay curled up in bed, but there was no photophobia. He answered questions well, but it was noted that he frowned slightly when concentrating his attention and that he yawned occasionally. The pupils reacted to light and accommodation, the left pupil being a little larger than the right. The eye movements were normal, and there was no facial paralysis. Although there was rigidity of the neck and pain on pressure over the vertex, there was no retraction of the head or abdomen. Knee-jerks were present and equal. Kernig's sign doubtful; Babinski negative. The grasp of both hands was good. No vomiting or emaciation; no difficulty in naming objects; abdominal reflexes normal; fundus oculi normal on both sides. Examination of chest negative. Leucocytosis 10,000. Lumbar puncture yielded *slightly turbid fluid under great tension*.

Examination of Ears.—The left tympanic membrane was retracted and pink, and showed dilated vessels radiating from the malleus. The right external meatus contained pus. An examination of a film of this discharge showed many leucocytes and numerous diplococci—some lanceolate. After syringing, it was seen that the right tympanic membrane was red and bulging, and that the outline of the malleus was lost. A small perforation was present in the posterior part of the membrane.

Functional Examination — (Cochlear Apparatus). — Schwabach lengthened; Weber not lateralised; Rinne negative on the right side: on the left, bone and air conduction were equal. Low tones (C₃₀₀) heard by both ears; upper tone limit 18,000 D.V.S. Whispered speech was heard by both ears at six feet, and with the noise apparatus in the left ear the patient could hear the conversation voice at four feet. The watch was heard at six inches by the right ear and at two inches by the left. The watch was heard on both mastoid processes.

Vestibular Apparatus.—There was slight rotatory and horizontal nystagmus on looking to the right and left. The spontaneous pointing test showed deviation to the right at the wrist-joint with both hands—most marked with the right. The fistula test was negative. The rotation test was not applied, as the patient was not

well enough to be placed in the turning-chair. Cold syringing of the right ear produced horizontal and rotatory nystagmus to the left in 90 seconds, while cold syringing of the left ear took only 40 seconds to produce similar nystagmus to the right.

The patient was transferred to Ward 37 on 19th February.

20th February 1914.—Patient lying on left side with eyes not completely closed. Temperature 98·2. The pulse is becoming slower; it was 104 on the 14th, and is now 76. Respirations 28 on the 14th, and now 18. The boy is rather drowsy, and answers questions slowly. When asked, he complains of pain at the back of the head on both sides. A few moments after examination, or after answering a question, patient again has his eyes half shut. There is spontaneous horizontal nystagmus on looking to the left. No nystagmus to the right or on looking up or down. No restlessness. Spontaneous pointing test as before. There is no tenderness on tapping over the vertex or temporo-sphenoidal lobes, but there is slight tenderness over the posterior fossa, especially on the right side. No pain on percussion of spine. The grasp is stronger on the right side, but the patient is right-handed. The pronation and supination test shows that the two sides are equal, though the patient appears to tire rather easily. No limitation of field of vision by the rough test. The patient can stand with eyes shut and feet together, but is rather uncertain, and cannot stand on either foot alone with his eyes shut. On attempting to walk straight forward with eyes shut he deviates markedly to the right, *i.e.* in the direction of the slow component of the spontaneous nystagmus.

Operation.—5 P.M., 20th February 1914.

Chloroform, followed by ether. Incision behind right ear half an inch behind insertion of auricle. Mastoid cortex appeared rather pale. The mastoid process was diploetic, and the antrum contained a little watery pus. A transverse incision was made backwards from the middle of the original incision, and the bone removed over the sigmoid sinus. A large perisinus abscess was thus opened, containing greyish-brown, watery pus, without offensive odour. The sinus wall showed healthy granulations just below the upper knee, and the dura was not discoloured or necrotic. The bone was removed for half an inch backwards, towards the torcular, in order to thoroughly drain the abscess. During this proceeding the weakened anterior wall of the sinus gave way and a copious gush of fluid blood escaped, which was, however, easily controlled by packing with iodoform worsted. The antrum and the external meatus were also lightly packed, and the posterior wound was left open.

21st February 1914.—Patient passed a good night; no vomiting; temperature 98°; pulse from 80 to 90. Slight horizontal nystagmus to right; more marked horizontal and rotatory nystagmus to left; spontaneous pointing test normal.

22nd February 1914.—Nystagmus to left only. Babinski's sign

present on left side; slight ankle clonus. Patient had a good night; no vomiting. Lumbar puncture yielded clear fluid under great pressure. Cultures from the fluid showed only contamination (staphylococci and sarcinae).

23rd February 1914.—Nystagmus to right continues, also to left. Pulse 63; temperature 98.2. Wound dressed and shows reaction.

Kernig's and Babinski's signs still present on left side. Fundus normal (Dr. J. V. Paterson). No headache or vomiting. Spontaneous pointing error to right still present with right hand. Boy sleeps well.

24th February 1914.—Temperature 98; pulse 58. Takes food well. I.S.Q.

25th February 1914.—Patient examined by Dr. Edwin Bramwell. Abdominal reflex obtained on right side, but not on left. Knee-jerks present and equal on both sides. Babinski definitely extensor on both sides. Kernig's sign present on both sides, more marked on right. Ankle clonus on left side. Left pupil a little larger than right. Nystagmus as before. No rigidity of neck now. Temperature 98.4; pulse 80. Wound dressed and looks satisfactory.

27th February 1914.—Babinski's and Kernig's sign still present. Temperature 97.2. Patient looks better; tongue clean and moist. Nystagmus to left practically gone, and very slight to the right. Spontaneous pointing test normal.

1st March 1914.—Abdominal reflex present on both sides. Kernig's sign almost gone. Babinski still present.

3rd March 1914.—Nystagmus to right has disappeared. Horizontal nystagmus to left still present. Whisper heard at one yard through the bandages. Kernig's sign absent.

7th March 1914.—Onset of fever, headache and sore throat, but no rash evident. Nystagmus again present to right and to left.

8th March 1914.—Vomiting. Temperature 101 last night; pulse 130. No rash.

9th March 1914.—Tongue typical of scarlet fever; slight rash. Patient transferred to Fever Hospital.

24th April 1914.—Patient reports on return from Colinton. Looking fat and well. The right ear is now dry, though the membrane still shows slight congestion. Left tympanic membrane is still indrawn. The tonsils are large, and adenoids are present. Behind the right ear there is a healthy, healing ulcer about the size of a three-penny piece. Conversation voice is heard by the right ear at twenty feet and the whisper at four feet.

Remarks.—In those cases of extradural abscess associated with septic sinus thrombosis, purulent leptomeningitis, or cerebellar abscess, the outer surface of the dura in contact with the pus is usually greyish-brown or greenish in colour. In both of the recorded cases healthy red granulations were present.

In the latter case the predominant symptoms were those of meningitis—headache, stiffness of neck, Kernig's and Babinski's signs, increased tension of cerebro-spinal fluid with turbidity on the occasion of the first lumbar puncture. There was, however, an absence of the restlessness so characteristic of purulent otitic meningitis; the patient was in fact rather drowsy, and the headache was not so severe as to cause the boy to cry out. Some of the more severe symptoms of purulent meningitis were also absent, such as photophobia, pain on pressure on the eyeballs, and paresis of the ocular muscles. The labyrinth was healthy on both sides, as was shown by the functional examination of the cochlear and vestibular apparatus. On the other hand, the symptoms pointed to a lesion of the posterior fossa, *e.g.* spontaneous nystagmus, spontaneous pointing error, slight Rombergism and deviation on walking with the eyes shut. The case appears to have been one of so-called "serous meningitis." The writer is indebted to Dr. Logan Turner for permission to publish this case.

A CASE OF GENERALISED VACCINIA.

By R. CRANSTON LOW, M.B., F.R.C.P.,

Assistant Physician to Skin Department, Royal Infirmary, Edinburgh.

THE following case is of interest on account of the rarity of the condition. The patient, a boy of eighteen months, was first seen on 14th September 1911, suffering from a papulo-vesicular seborrhœic dermatitis in patches on the body and limbs. He was treated for three weeks in the skin wards of the Royal Infirmary under Dr. Norman Walker, to whom I am indebted for permission to record the case. He improved considerably, but had to be sent home because he developed whooping-cough.

He was not seen again till 4th April 1913 (*i.e.* at the age of three years) when he was brought up to the Infirmary with a more extensive seborrhœic dermatitis than he suffered from when in the ward previously. The face, body, and limbs were almost completely covered with an eruption, which had the usual appearances of seborrhœic dermatitis, being dry and scaly in some places and moist in others. The extensor aspect of the right thigh was somewhat swollen and showed numerous discrete pustules, some of which had a distinct depression in the centre. As the temperature was 101° and the child looked ill he was again admitted to the ward. The same evening the temperature rose to 103·8° and the eruption had spread considerably both upwards and downwards. During the next twenty-four hours the eruption continued to come out till the head, face, body, and limbs were

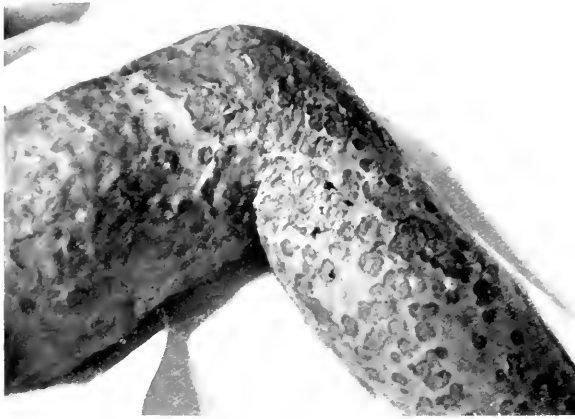


FIG. 1.



FIG. 2.

covered with it. It was particularly severe on the face, and accompanied by a great deal of swelling, so that the eyes were closed. Everywhere the eruption had the same characters—small pustules flat on the surface, and many of them showing distinct umbilication in the centre. These pustular lesions all appeared on the top of the seborrhœic dermatitis lesions. Fig. 1 shows the appearance of the right leg four days after admission. Most of the lesions had burst, but a few pustules with distinct dimples in the centre are still visible.

On admission boracic starch poultices were applied to the right thigh and the other parts were dressed with ammoniated mercury paste (grs. v. to $\bar{5}$ i.). This treatment was continued for three days, the temperature remaining about 101° , accompanied by considerable general prostration. Then cloths soaked in 5 per cent. ichthyol in water were applied to the legs, and 20 per cent. ichthyol in water was painted all over the other parts. Within a few hours improvement took place, the temperature gradually falling till it was normal on the seventh day. The suppuration diminished and the lesions began to heal up. As soon as the pustules healed up an ichthyol paste (℞x. to $\bar{5}$ i.) was used and the seborrhœic dermatitis rapidly improved. The child was in the ward for five weeks, and went out with a small amount of dermatitis here and there, but the whole skin, especially that of the face and thighs, showed very marked pitted scars such as are seen after variola (Fig. 2).

The diagnosis in this case lay between variola, varicella, and generalised vaccinia. The actual lesions were extremely like those of smallpox, and the child, owing to its previous skin condition, had never been vaccinated. The lesions were more pustular from the start than are the spots in variola, and there was a distinct spread of the lesions upwards and downwards from the right thigh where it first started. The child came from South Queensferry where so far as was known there were no cases of smallpox at that time.

An extensive varicella eruption might have produced such lesions, but here again the method of spread was against that diagnosis, no fresh spots coming out after 48 hours from the commencement. Although there were other children in the ward who had not had varicella, none of them developed the disease.

On making inquiry, Dr. Dickson of South Queensferry, who sent the case into hospital, informed me that he had vaccinated the

patient's younger brother, an infant of a few months, ten days before the eruption appeared on the thigh. The infant's vaccination took well and ran a normal course, and I think there can be no doubt that the child's mother, who had been dressing her baby's vaccinated arm and at the same time treating the older boy's skin for the seborrhœic dermatitis, had accidentally vaccinated him on the right thigh. As the child had not been previously vaccinated it "took" on the thigh, and as his dermatitis was very itchy he spread it at first to other parts by scratching; but as the eruption came out all over the body, etc., so rapidly, it is probable that a blood infection took place. The vaccine lymph used was French (Chaumier's), and Dr. Dickson had vaccinated several cases from the same set of lymph and all had taken well in the ordinary way. As some of these lymphs are prepared from animals not inoculated with cowpox, but from actual cases of smallpox, that might account for the close resemblance of the lesions to variola.

I have to thank Dr. Robert Aitken for the photographs of the case.

REPORTS OF SOCIETIES.

Edinburgh Obstetrical Society.

THE first meeting for the session was held on the evening of 9th December, the President, Sir Halliday Croom, in the chair.

The President of the Royal College of Physicians, the President of the Royal College of Surgeons, and a large representation of Fellows of the Society and of other members of the profession in the city and neighbourhood were present.

The President in a brief speech introduced Professor Jacobs of Brussels, who gave an appalling account of the state of Belgium, and more particularly of the sufferings of the medical profession there. He pointed out that the Belgian medical men are sharing to the full in the general distress. A strong sense of duty alone is keeping many of them in districts which have been absolutely devastated by the Germans, and before these men there stand many months during which they know that they will have to suffer whilst giving all their services to their country. Professor Jacobs mentioned numerous instances of suffering which were within his personal knowledge. Many doctors, for example, had to work as navvies in order to gain a few coppers for a livelihood; others had to sell such few belongings as were left to them. Many he knew who had not even seen bread for a fortnight, and who had to sleep on a little straw on the bare ground. Several of his own colleagues were so impoverished that their very clothes and boots were falling to pieces. One professor of Louvain University had with his wife subsisted for three days on wayside herbs. Another he found looking for his wife and family whom he had not seen or heard of for six days. One Belgian professor was shot after having had his

ears cut off and his eyes put out, and the German soldiers then carried his head round the town on the end of a lance! Professor Jacobs then related a few instances of German "Kultur," of which one mild example may be quoted. Three weeks before the war broke out he operated on a lady near Namur, and by the beginning of August she was convalescent. A day or two after the outbreak of hostilities she was, before the eyes of her husband, violated by seven German soldiers, as a result of which she died two days later.

Sir A. R. Simpson moved a hearty vote of thanks to Professor Jacobs. Germany was not trying to conquer, but to murder and obliterate, Belgium, and the nation that attempted such a crime must perish. The Germans had no word of their own for culture; they did not know the real meaning of it, and they had given the word a debased significance for all time. Germany's methods were the end of all true culture. He believed that ever since 1870 Germany had steadily deteriorated through pride and material success. She would have to learn to serve before she could ever hope to be able to rule.

Sir James Alleck seconded the motion in a few words and assured Professor Jacobs of the hearty sympathy of the meeting.

The President, in conveying the thanks of the meeting to Professor Jacobs, was able to inform him that a sum of well over £100 had been promised by those present, which they hoped he would accept and administer for the medical profession in Belgium.

RECENT ADVANCES IN MEDICAL SCIENCE

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., J. D. COMRIE,
M.D., AND ALEX. GOODALL, M.D.

PRACTICAL APPLICATION OF THE LUETIN TEST.

OVER two years ago Noguchi showed that cases of syphilis gave a local reaction to an endodermal injection of a sterile extract of the pure culture of *treponema pallidum*. The reaction appears to be specific for syphilis, and seems to depend upon an increased sensitiveness of the skin, comparable to the tuberculin reaction in tuberculosis.

Noguchi (*New York Med. Journ.*, 22nd August 1914) now publishes a statistical estimate of the practical value of the luetin reaction based on the observations of about fifty investigators.

The reaction is present in less than 30 per cent. of cases of primary syphilis and is usually very mild. In secondary syphilis the reaction occurred in 47 per cent. of 630 cases. In tertiary syphilis the reaction was found in about 80 per cent. of cases. In nervous cases the reaction is less frequent in acute syphilitic meningitis than in parenchymatous affections, such as general paralysis and tabes. In the latter conditions it is present in about 60 per cent. of cases. The reaction is present in about 90 per cent. of cases of visceral syphilis. It is especially marked

in the cases of aortic incompetence. The reaction occurs in 70 per cent. of cases of congenital syphilis.

The luetin test and the Wassermann reaction do not always run parallel in the same case. The luetin reaction may be absent when the Wassermann is strongly positive, or the reverse. The discrepancy is explained by the fact that the luetin reaction indicates the allergy (local hypersensitiveness), while the Wassermann reaction denotes the presence of an active syphilitic process.

The statistics show that the Wassermann is the more constant reaction among the primary and secondary cases, as well as in general paralysis, but the luetin is the more constant in the chronic cases, especially those under treatment.

The luetin reaction appears to have considerable significance as regards prognosis in syphilis. Why should some cases of paralysis give a positive and others a negative reaction?

It is suggested that paretics with a positive luetin reaction are still capable of deriving some benefit from antisyphilitic treatment, since the reaction is in a measure indicative of a mesenchymatous tertiary process.

The preparation of luetin requires a perfectly-equipped modern laboratory, but the application of the test may be entrusted to a larger number of physicians than in the case of a complicated serological test. A certain amount of experience is required to interpret the results of the test in a reliable manner, but occasional difficulties in the determination of a dubious result should not prove an impediment to its practical value.

HYPERTHYROIDISM AND EXOPHTHALMIC GOITRE.

Ballard (*New York Med. Record*, 10th October 1914) considers that hyperthyroidism is probably much more common than the average practitioner thinks. An important source of error is that the presence of exophthalmos and goitre are considered essential symptoms in its diagnosis. These symptoms really mark a rather advanced stage of the disease, which can be recognised before they develop. Tachycardia is the most constant single symptom of hyperthyroidism. It may, of course, be due to other causes, but these can fairly easily be excluded. While the usual range of the pulse-rate is from 120 to 180 per minute, there may be a painful palpitation, which is a very distressing accompaniment of the disease. Of the so-called minor symptoms, muscular tremor is the most important. Muscular weakness is another important symptom, both in the early and late stages. In the earlier stage this weakness may be attributed to neurasthenia or nervous exhaustion. It is possible that weakness affecting the muscles of the orbit has much to do with the production of the exophthalmos and the

von Graefe and Stelwag signs which are common in the more advanced stages.

Nerve excitability is one of the most common and earliest symptoms of hyperthyroidism. Nerve depression may, however, occur, and paralytic symptoms of various groups of muscles may arouse the suspicion of hysteria. A gradual loss of weight may be the main cause of complaint, even in the very early stage of the condition, and is a constant symptom in the later stages. The association of tachycardia and loss of weight may be mistaken for tuberculosis. In the later stages, when weakness and loss of weight become marked symptoms, the condition should not be confused with diabetes. Sugar is not infrequently present in the urine of patients at this time.

Paroxysmal attacks of vomiting, diarrhoea, and profuse sweating may occur, and as they are by no means peculiar to hyperthyroidism, the correct diagnosis depends upon the recognition of their etiology.

Rest assumes a position of first importance in treatment, and should be mental and emotional as well as physical. The application of X-rays to the thyroid is strongly recommended.

Brooks (*Long Island Med. Journ.*, September 1914) also calls attention to those minor manifestations of hyperthyroidism which point in the direction of exophthalmic goitre without actually developing into it.

Enlargement of the thyroid gland, oftentimes with choking symptoms or symptoms of constriction in the throat—a picture not infrequently attributed to globus hystericus—occurs in girlhood with great frequency, particularly at about the time when the menstrual functions are becoming established, when the mammary glands are undergoing rapid development, and when fancies, affections, and temperament are in process of formation. Similar though less striking symptoms appear in boys and young men. Analogous conditions appear during pregnancy, notably in the first weeks or months, and particularly in primiparae. Tachycardia, mental irritability, excitability, tremor, and nausea are frequently noted, and these have but to become exaggerated to represent typical instances of exophthalmic goitre. It is of course open to argument that the symptoms do not depend on the thyroid enlargement but are simply coincident, but there is a considerable body of evidence that the symptoms do depend on excessive thyroid secretion. It has been shown experimentally that when the thyroid is removed in animals sexual development and differentiation fail to take place. The same effect is observed in congenital human hypothyroidism, that is, in cretinism. The body fails to differentiate along natural lines. The characteristic distribution of the hair, the evolution of the mammary gland, and the changes in the pelvic bones differentiating the sexes all fail to occur, or at least do not develop to a normal degree. It is quite conceivable that, given a hyperthyroid

secretion, exaggeration of development in these directions, both mental and physical, may occur. In practice, young persons are frequently seen in whom an increased thyroid bulk is associated with sexual precocity in both mental and physical directions.

The effects of castration in early youth have a close resemblance to the characteristics of cretinism.

On the other hand, when children are over-active mentally, when their over-activity over-steps the bounds of the physiological and vivacity becomes petulance and irritability, the possibility of hyperthyroidism must be considered.

Many such cases are characterised in addition to the mental symptoms by tremor, tachycardia, even at times by exophthalmos, and commonly intolerance of iodine and thyroid hyperplasia. The administration of thyroid will in these cases cause a marked aggravation of the symptoms.

Walton (*Practitioner*, October 1914) discusses the operative treatment of exophthalmic goitre. He answers the question, "Is the disease due to an excess of thyroid secretion?" in the affirmative. He then asks, "Are the results of medical treatment satisfactory?"

The average over several hundred published cases appears to give a mortality of over 15 per cent. Another important factor to be considered is the length of time a patient is partially or wholly disabled while under medical treatment. There is no specific form of medical treatment, but by complete rest and with the aid of certain drugs symptoms may be ameliorated very greatly. The trouble is that when a return is made to an active life, a relapse occurs almost immediately. Better results have been claimed for the use of X-rays, but the average duration of treatment is about five months, and there is still a large proportion of failures. At the best the patient is an invalid for several years.

The question of operation mortality is not easily answered, the statistics of different surgeons showing considerable variation. Mayo, however, quoted 278 cases without a death, and Kocher's most recent series show a mortality of less than 3 per cent.

The question whether the results of surgical treatment are more satisfactory in the end than those of medical is also difficult. The difficulty of obtaining after-histories is manifest, but Walton claims that the operative and post-operative mortality of the cases are together less than the mortality following medical measures.

After operation, the nervousness, the cardiac irritability, the enlargement of the remaining portion of the thyroid, and the gastric and intestinal irritabilities recover in a comparatively short space of time. Usually within a month or six weeks of operation the patients are able to get about in comfort, but exertion is followed by an increase in the pulse-rate and a certain amount of dyspnoea. The exophthalmos is more slowly recovered from.

The general impression which one receives from a survey of the literature is that medical treatment should receive a fair and probably a prolonged trial first. In the absence of improvement or in view of a probably prolonged period of invalidism surgical operation may be considered. There seems to be a certain but not very great operative risk. A large proportion of operations are followed by a complete recovery or a satisfactory improvement. On the other hand there is a certain proportion of failures. In some instances these are due to operation being too long delayed, but in others the failure remains inexplicable, and neither the physician nor the surgeon can predict whether any given case will turn out a success or a failure.

THE PARAFFIN TREATMENT OF CONSTIPATION.

Kellogg (*New York Med. Journ.*, 12th September 1914) reports the results of a very large experience of the use of paraffin in constipation. Among the special advantages of paraffin are its non-irritating properties. Even the mildest of ordinary laxatives are irritating, and their use may be followed by colitis or by a necessity for their continuance. Paraffin is non-absorbable. It simply passes through the body, and while it does not carry away anything that is useful, it dissolves and carries away a considerable amount of toxic substances. It does not increase intestinal putrefaction as do animal fats and oils, nor does it inhibit the secretion of hydrochloric acid as do fats and oils. Whereas cascara and other drugs of the same class irritate the stomach as well as the colon, they are not available for the treatment of constipation associated with hyperchlorhydria. Paraffin is especially useful in these cases. Its effects are not diminished by continued use. Cases in which the colon is redundant or is obstructed by kinks, folds, adhesion bands, etc., may be made comfortable and be saved operation by the habitual use of paraffin. Most laxatives increase the absorbing power of the bowel by causing irritation and congestion, and the risk of absorption of toxins is therefore increased. Paraffin does not affect absorption and actually carries off toxins in solution. It is easily taken, and it is an ideal laxative in surgical cases. The presence of paraffin in the stools when it has been given after operation indicates that there is no obstruction, and that peristalsis is present. It is an admirable laxative in pregnancy. It affects neither the uterus nor the infant.

The drawbacks to the use of paraffin include occasional nausea. This is usually overcome by making the paraffin into an emulsion and flavouring with sugar, honey, or lemon. Itching about the anus sometimes follows its use. This is due to infection of the skin, and can be avoided by careful cleansing. Involuntary discharge of oil sometimes occurs, but tends to disappear as the rectum recovers its normal sensibility. Flatulence may be complained of, and is due to imperfect emptying of the colon. The symptom generally disappears after a few weeks.

In the use of paraffin for constipation failure is never complete, for the reason that the oil passes through and carries with it a large number of bacterial toxins and poisonous waste material, even though complete bowel movements are not secured. In such cases the fæces are not infrequently discharged in hard, round masses. This condition indicates the necessity for more bulky diet. By the use of agar-agar and bran, as well as fresh vegetables, in connection with the paraffin, this difficulty may be overcome.

Accessory measures may be required. Perhaps the most important factor is the bulk of the intestinal contents. Such food-stuffs as milk, eggs, meat, fine flour, bread, butter, cheese, potatoes and pastry, leave practically no residue in the intestine, as they contain practically no cellulose. The only way in which the bulk of food residue can be increased is to add vegetable foods which abound in cellulose to the dietary. Green vegetables and fresh fruits are of great value. The combined use of agar-agar and paraffin overcomes the difficulty in almost every case. Colon massage may be invaluable when the foregoing means are ineffectual alone. The use of cultures of acid-forming bacteria such as *Bacillus bulgaricus* may be an aid. In certain cases of constipation the colon is so crippled that complete relief is not obtained without the use of surgery.

A. G.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

OPERATIVE TREATMENT OF DISEASES OF THE LARGE INTESTINE.

IN the *Annals of Surgery* for October 1914 W. A. Oppel of Petrograd reviews his operative procedure in diseases and abnormalities of the large intestine. His statistics, as is common, show a high mortality, and he attributes it to two reasons: (1) The definite indication for one or another method of treatment is not yet sufficiently settled. (2) The methods of anastomosis and resection have still to be carefully investigated and improved. In his paper the author gives specific examples of cases in which he failed to bring about the cure that he anticipated; by these results he has learned, and others would be the better of taking note of them for future guidance. He says that after a complete unilateral exclusion, no matter whether such exclusion was effected by means of a communication between the ileum and transverse colon, or by means of an ileo-sigmoidostomy, the part of the colon thus excluded forms a *cul-de-sac*, which by means of a retrograde peristaltic movement fills up with fæces and thus causes trouble—may lead to perforation and cause death.

Von Beck had 32 patients on whom he performed ileo-sigmoid-

ostomy for various causes, and of these six developed intestinal stasis in the excluded *cul-de-sac*.

Another point he emphasises is the danger of a "vicious circle" in the performance of a short-circuit operation by lateral anastomosis. In some cases in which the caecum and sigmoid were anastomosed the result was that the faecal contents still passed up the ascending colon from the ileum and then when they reached the sigmoid they passed back into the caecum through the anastomosis; thus the patient's condition was much worse than before.

In discussing the much vexed subject of the surgical treatment of "colitis" he considers that the condition should at first be treated by the physician, but not for too long a time, as in its later stages colitis is very intractable to radical treatment. Abnormality in the anatomical position of the large intestine is the predisposing cause, he believes, in a great many cases, and *that* abnormality supports the existence of the disease. He therefore advocates the making of an artificial anus in the caecum, a procedure which is of benefit not only in the rest that it gives the colon, but also, by anchoring the affected part of the intestinal tract, undoes the anatomical abnormality causing the disease.

In concluding his article he says that experimental pathology teaches us that in dogs we may remove the whole of the large intestine without any bad results; Arbuthnot Lane states that in man the greater part of the large intestine can be removed without danger, and often with great benefit. His firm belief, therefore, is that resection is much superior to the performance of "short-circuiting."

In doing resection it is often convenient to remove an extra piece of bowel distended by gas or packed with faeces simply to diminish the risk which would be incurred were this area cut through. Thus, for instance, in stricture of the hepatic flexure with proximal distension he would remove the enlarged and distended caecum and ascending colon to avoid infection. With regard to technique, he strongly advises the "two-step" operation, and in support of this quotes the important statistics of Finkelstein—29 per cent. mortality in one stage operation as compared with 16 per cent. mortality in the "two-step" operation. In operating he especially regards two points—rapidity and simplicity. In resecting he ligatures the divided end and then he inverts the stump, burying it by a running purse-string suture, and finds that this rapid simple method gives excellent results. His final advice is the same that one hears everywhere—"For better results and lowering of mortality send in the patients early."

FRACTURE OF THE NECK OF THE FEMUR.

Royal Whitman of New York (*Annals of Surgery*, October 1914) brings forward a method of treatment not usually practised, from

which he seems to get excellent results, and which obviates many of the worries and after-results, *e.g.* traumatic coxa vara, etc., that sometimes follow on a fracture of the neck of the femur. He anaesthetises the patient, lifts him on to a pelvic support, and has the extended limbs supported by assistants. First he gets the sound limb abducted to its normal limit to fix the hip and the pelvis, but also to act as an index for abducting the injured limb. The injured limb is now flexed and rotated to disengage all soft parts (if any) between the fragments. Traction is now applied to the affected limb by the assistant and sufficient force is used by him to undo the shortening. Still keeping up the extension, the limb is abducted to its normal limit of abduction and is held there. Plaster spica bandages are now applied over the thorax, pelvis, and injured limb. When the plaster sets the limb will be found to remain of normal length and the redisplacement does not recur.

The rationale of this treatment is that in abduction the outer fragment is turned to meet the inner fragment, the lower part of the capsule becomes tense and directs the two fragments to one another, and by its action as a local splint keeps them there. Upward displacement of the shaft is prevented, as in abduction the top of the great trochanter comes against the fixed pelvis and cannot rise higher. Muscles also aid in keeping the two pieces in contact in the abducted position, as the pelvic-trochanteric muscles are relaxed and will not thus tend to pull up the lower fragment; the ilio-psoas and adductors are tense, and pull the outer fragment in to the inner. Thus by close and direct co-aptation of the two fragments the author says, and that is clear enough, one gets speedy and firm union. The method is of especial advantage in aged persons, as weight extension is not required. Thus the foot of the bed does not require to be raised for counter-extension, and the risks of pulmonary congestion are diminished, as the head of the bed can easily be raised if the patient be fixed in plaster. By this abduction he obviates all possibility of the other danger after healing has taken place—*i.e.* traumatic coxa vara.

SPINAL ANÆSTHESIA.

W. Mayne Babcock (*Amer. Journ. Surg.*, October 1914) gives an excellent résumé of the present state of spinal anaesthesia, and, what is more interesting, the lessons learned from 6000 administrations. He employs stovaine in the light solution, *i.e.* without glucose, as he finds that in some cases he might wish to employ the Trendelenburg position, or he may have to lower the head of the patient for circulatory trouble. If he made use of the heavy solution, and was forced to lower the head, then dangerous results would follow—the heavy solution would gravitate to the upper part of the spinal canal and cause death. The injection of

weak solutions in the lower part of the cerebro-spinal canal is relatively safe, for as they diffuse upwards toward the phrenic nerve roots of the cervical region they are so weakened and diluted as to have little effect. Weak solutions injected into the upper dorsal or lower cervical are dangerous, as they interfere directly with innervation of muscles of respiration. Strong solutions of high specific gravity injected into the lower part of the arachnoid cavity may, as said before, be very dangerous by upward gravitation unless watchful care is taken not to elevate the pelvis until a sufficient time has elapsed to permit of the absorption of the bulk of the drug. It is evident, therefore, that for successful anaesthesia, the operator should understand clearly the physiological action, the dosage, and the interspace most suited for the special operation to be performed. Although spinal anaesthesia is relatively safe and very effective in skilful hands, it is exceedingly dangerous and unreliable for those who do not understand its action.

Patients with advanced peritonitis with great abdominal distension are bad subjects, especially if middle-aged and obese. If suffering from collapse or advanced septic disease of the biliary tract, or if the patient has any disease of the respiratory system, such as empyema, then spinal anaesthesia is dangerous and should not be employed. Aged and debilitated patients require only very small doses of stovaine and this given with great care. No anaesthetic gives as great a degree of muscular relaxation with as little danger as spinal anaesthesia.

RELIEF OF GAS PAINS AFTER APPENDECTOMY.

Kenefick (*New York Med. Journ.*, November 1914) gives the result of experiments to get rid of the flatus pain that occurs in so many patients the second day after appendectomy.

The author says that the history of most cases of appendicitis includes symptoms of intestinal fermentation, due to the action of bacteria. Bearing in mind, he continues, that bacteria are the primary factor, the idea of previous sterilisation was considered, with the result that his patients now pass through convalescence with no pain or discomfort. He attributes his success to giving the following dose the afternoon previous to operation:—Acetyl-salicylic acid ester, grs. xx.; calomel, gr. i.; sodium bicarbonate, grs. v., given dissolved in two to four ounces of water. The morning of operation the usual enema is given, and as a result of this treatment and preparation absolute peace is got throughout the convalescence.

F. E. J.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

GESTATIONAL DERMOGRAPHISM.

PROFESSOR HECTOR TREUB of Amsterdam has investigated dermographism in pregnancy, and has published the results of his investigation in the *Archives mensuelles d'obstétrique et de gynécologie* (ann. iii. No. 7, p. 35, July 1914). It was by accident that he noticed the phenomenon in a primipara in the close of 1912. He found that by passing his finger gently along the skin of the abdomen he was able to produce a white streak which remained visible for several minutes and did not project above the surface. The same effect was produced, but still more distinctly, when the handle of a pen was employed; indeed one of Professor Treub's assistants was able thus to write the intended name of the hoped-for male child on the skin of the abdomen of the expectant mother. This white, smooth dermographism remained for several days after confinement, but had disappeared by the tenth day. It was next discovered that with rare exceptions all pregnant women showed a white dermographism in the later months of gestation, and that in some it could be elicited at the third or fourth; further, it was always most marked over the abdominal wall and less so on the skin of the legs and arms. Details were given of individual cases, in two of which scratching the skin produced a red mark with a white halo round it. Dermographism was not, of course, a specific sign of pregnancy; but, on the other hand, pregnancy was not without importance in the production of the phenomenon. Professor Treub was able to say that during the pregnant state white and smooth dermographism was produced more regularly, in a more marked way, and after a much slighter irritation of the skin than it was apart from gestation; he thought also that it indicated an extremely slight form of one of the toxicoses of the pregnant condition. It was probably to be ascribed to vasomotor action, but the explanation was rendered difficult by certain of the observed facts. Thus it was noticed that the phenomenon could be produced on the abdominal wall when the woman was resting horizontally but not when she was erect, and that in one case there was white dermographism when the patient was lying and red when she was standing; these effects seemed to be due to the tension of the abdominal wall being increased by the erect posture. There would appear to be room for investigation of the phenomenon by physiologists and neurologists, and doubtless their inquiries will tend to throw light upon the still vexed question of the nature of pregnancy.

OPERATIVE TREATMENT OF GENITAL PROLAPSE.

In an address in obstetrics given by Professor Jellett at the annual meeting of the Canadian Medical Association in July 1914 the operative treatment of genital prolapse was dealt with systematically and fully; the address afterwards appeared in the *Dublin Journal of Medical Science* (3rd ser., No. 513, pp. 161-178, September 1914). The speaker told his audience that whilst he regarded obstetrics and gynecology as more or less conjoined, his inclinations lay more in the direction of gynecological practice, and that therefore he had decided to take a somewhat gynecological subject for his address; besides, as he remarked, although prolapse might be cured by the gynecologist, it was, alas, often produced by the obstetrician. The frequent failure of the operative treatment of prolapse was due to an insufficient anatomical knowledge of the relations and supports of the uterus and to a desire to find a panacea. Neither hysterectomy, nor extensive vaginal narrowing, nor even ventral fixation could be regarded as an operation suitable for every case: for the first named did not prevent prolapse of the vagina, whilst the second plan did not necessarily negative an inversion of the vagina as a whole, and even the third might be defeated by an elongation of the uterus. Two things had to be borne in mind: one was that the exact lesions present differed to a very material extent in different cases, and the other was that treatment to be successful must follow lines which made it possible to alter or modify details in order to suit special lesions and complications. A knowledge of pelvic anatomy was essential. Three structures under normal conditions kept the vagina in its place: these were, first, the levator ani muscle and investing fascia; second, the vaginal suspensory ligament—a fold of the pelvic fascia; and third, its attachments to the cervix, and parts of the endo-pelvic fascia which had an insertion both into the cervix and into the upper part of the vagina. The uterus, again, was supported directly by the vaginal attachment, by the utero-sacral ligaments, and by the different layers of the endo-pelvic fascia which passed into it laterally and anteriorly. The endo-pelvic fascia formed a set of bands passing anteriorly to constitute the anterior false ligaments of the bladder, whilst another set went out laterally, lying beneath and surrounding the uterine arteries, and were called the cardinal ligaments of the uterus or Mackenrodt's ligaments. The indirect support of the uterus was the pelvic floor, aided by the fact that the uterus lay with its long axis almost at right angles to the axis of the vagina. When injuries occurred in labour, such as deep tearing of the perineum, the levator ani muscle lost its attachment to the central point of that structure, with the result that the vaginal walls began to descend, the suspensory fascia being unable alone to hold them up. Then followed backward displacement of the uterus, due to its weight and the general

relaxation of its ligaments, or to the traction exercised on the cervix by a prolapsing anterior vaginal wall. Thus through a change in the direction of the axis of the uterus almost all the support given to it by the pelvic floor was lost. This brought the utero-sacral ligaments and the endo-pelvic fascia into the line of strain, and these structures were unable by themselves to resist and so gradually yielded. Dr. Jellett explained hypertrophy of the supra-vaginal portion of the cervix which was associated with prolapse by supposing that the vault of the vagina had been the first part to prolapse and the body of the uterus the last. The accompanying displacement of the bladder was to be attributed directly to the pull of the anterior vaginal wall, and to the yielding of the ligamentous attachment of the base of the bladder and of the urethra to the posterior surface of the pubis. To summarise, prolapse was generally the result of an initial fault which, by altering the normal strain to which the parts of the suspensory mechanism of the uterus were intended to be subjected, threw them out of sympathy with one another. If, therefore, in operating for the cure of prolapse a single weak point were left, the condition would recur. This was why ventral fixation, which left the cervix free to drop into the axis of the vagina, sometimes failed; whilst vaginal plastic work was inefficacious, because it allowed the descending uterus again to dilate the vagina and force the muscles apart; and hysterectomy was not a success, because it took no account of the fixation of the vaginal vault. Dr. Jellett therefore thought that successful prolapse operations consisted of three parts: the restoration of the normal direct support of the uterus and vagina; the placing of the uterus in such a position that it offered the maximum resistance to descent; and the removal of complications and associated conditions, the result of the prolapse. For the first of these ends he recommended the shortening of the utero-sacral ligaments through the vagina at their point of attachment to the uterus. He thought that the shortening of the band of endo-pelvic fascia known as Mackenrodt's ligaments was not often to be advised, and that the moderate degree of shortening of them which always followed supra-vaginal amputation of the cervix should suffice. To restore the vaginal suspensory ligaments was most important, but no safe and satisfactory operation was at present available for this purpose, although Stanmore Bishop's had the promise of success in it. And he emphasised the value of a carefully performed perineorrhaphy to restore the levator ani muscle to its proper position. In order to meet the second of these aims (the placing of the uterus in the best position) Dr. Jellett advised the shortening of the round ligaments or ventral suspension of the uterus, whilst in the case of women past the child-bearing period he recommended Wertheim's interposition operation, by which the body of the uterus was made to lie between the bladder and the anterior vaginal wall in an extra-peritoneal position. Finally, the third purpose

(the removal of complications, etc.) was to be arrived at in various ways, according to the condition in existence; for hypertrophy of the cervix amputation was called for, for endometritis curetting, for enlargement of the body of the uterus without a tumour-formation the excision of a wedge-shaped portion, etc. By some such means as those he had named the speaker thought that the results after prolapse operations would be much improved. One may be allowed to make the comment that considering the haphazard way in which operations for prolapse are sometimes decided upon, the measure of success achieved in ordinary practice is rather remarkable.

URETERAL OCCLUSION IN GYNECOLOGY.

Dr. Walter Clinton Jones' inaugural thesis on experimental ligation of one ureter, with its application to clinical gynecology, is a valuable piece of work, and it is well that it should appear in the *American Journal of Obstetrics* (vol. lxx. pp. 329-410, September 1914). His experiments consisted in the ligation of the ureter in 52 dogs, and in a careful study of the results, along with observations upon a case of probable ureteral obstruction by accident in a woman who had had hysterectomy performed for fibroids. From his experiments Dr. Jones concluded that during the first ten days after complete ureteral occlusion the gross changes in the kidney were not marked; from the tenth to the sixtieth day primary hydronephrosis was in progress; at the end of about two months the kidneys might be divided into two groups—those which continued to enlarge, and those which underwent general atrophy. Further, more or less gross evidence of intra-renal infection was almost constant after the tenth day; if it was mild then general atrophy took place, whilst if it was severe it was followed by pyonephrosis, with renal dilatation, etc. Perirenal anastomoses did not seem to favour the development of hydronephrosis. There was considerable evidence that low ligations were much more prone to be followed by atrophy than high ones; and young dogs were more liable to infection than old ones. With regard to operative injury of the ureter in the human subject, Dr. Jones was of opinion that it happened in from 1 to 3 per cent. of all intra-peritoneal operations upon the female pelvic organs, and more commonly when the vaginal route was followed. The causes were displacement or involvement of the ureter by pathological structures (uterine and ovarian tumours), congenital abnormalities, and lack of care by the operator. The different kinds of ureteral injuries, stated in the order of their frequency, were ligation, clamping, kinking, incision, resection, and destruction of blood-supply. The results of complete obstruction in their order of seriousness were infection, fistula, hydronephrosis, and general renal atrophy; these were local. The general ones were toxæmia, which was very rare, anuria (also rare), and no symptoms at all (in 21 per cent.). The

mortality of unilateral ureteral obstruction was 18 per cent., and the most important means of diagnosing the obstruction was the ureteral catheter. The important question of the prevention of the injury is thus dealt with by Dr. Jones: The pathological anatomy of each case should be carefully unravelled, beginning high up where the conditions were normal and the ureter easily found; each pelvic vessel should be isolated before it was tied; the preliminary passage of the ureteral catheter practically insured the safety of the ureter; and, above all, the imminence of the danger should be realised by the operator, for injury to this duct along with hæmorrhage constituted the two chief dangers in hysterectomy. In cases of irreparable injury to the duct in operations, intentional ligation of it might be indicated in order to get rid of the kidney functionally, and then it took the place of immediate nephrectomy, although the kidney might require to be removed later if serious symptoms arose. In some cases temporary ligation might be had recourse to if the injury to the ureter could not be repaired at the time; then a secondary operation for the restoration of the ureteral lumen might take place at an early date before the function of the kidney had become seriously impaired.

J. W. B.

PATHOLOGY.

UNDER THE CHARGE OF

THEODORE SHENNAN, M.D., AND JAMES MILLER, M.D.

DISTRIBUTION OF CHOLERA BACILLI IN THE BODY AND THE OCCURRENCE OF "CHOLERA CARRIERS."

UNTIL recently it was generally recognised that the *vibrio cholere* restricted itself in its action to the intestinal canal practically entirely. The symptoms of the disease were regarded as being due, in addition to the loss of water by the intestinal tract, to the action of toxins absorbed from the gut and not to the dissemination of the germs and the consequent formation of toxin-producing foci in various parts of the body. In the light of recent research work this view will have to be reconsidered. A number of important papers have been published during the last two years by Major Greig, C.I.E., I.M.S., who has been on special duty for cholera inquiry. These papers have been published in the *Indian Journal of Medical Research* (vols. i. and ii.), and in the *Lancet*. His research has led the observer to examine the gall-bladder and bile passages, and by this means light has been thrown upon the question of the dissemination of the disease by means of "carriers."

As regards the methods employed by Major Greig, there have been the ordinary ones used for the detection of organisms in the tissues (*Ind. Journ. Med. Research*, vol. ii. No. 1, p. 1). It is all the more curious that previous observers failed in the endeavour to detect cholera

germs in the organs. Portions of the organs were removed with sterilised instruments, and in order to eliminate any possibility of accidental contamination the pieces of tissue were dipped in alcohol and flamed. They were then placed in peptone water and broken up with a sterile glass rod. The flasks containing the tissues were placed in the incubator at 37° C. After 6 and 24 hours subcultures were made on Dieudonné blood-agar. (This medium is prepared by mixing equal parts of defibrinated ox blood and normal caustic soda solution; three parts of this mixture are then added to seven parts of ordinary peptone-agar. The medium possesses the property of inhibiting the growth of such organisms as bacillus coli, while the cholera organism grows readily upon it.) Smears were also made from the various organs, and portions were fixed in alcohol, cut and stained. In this way a large number of fatal cases of cholera were thoroughly examined and the presence of the organism was demonstrated in the gall-bladder and bile passages, the liver, spleen, kidneys, and in areas of pneumonia in the lungs and in the mesenteric glands. Details of ten cases are given, of which the following is a typical example:—This patient lived for 5 days after the onset of the cholera. At the post-mortem examination a pure culture of the comma bacillus was obtained from the bile, and the wall of the gall-bladder and cystic duct showed definite pathological changes. Pneumonic areas were present in both lower lobes, and from these a pure culture of the bacillus was obtained. The author states that pneumonia in cases of cholera is a very serious complication and by no means infrequent. Previous to this investigation the etiology of the condition had not been clearly demonstrated. The cholera organism was also cultivated from both kidneys. During life, cultures were obtained from the urine. The pathological changes found on microscopic examination indicated that the invasion of the tissues by the cholera vibrio had occurred some time before death.

In a special paper (*Ind. Journ. Med. Research*, vol. i. No. 1, p. 90) Greig records 55 cases of cholera which he examined systematically for the presence of the vibrio in the urine. He was successful in recovering the cholera organism in 8 of these cases. From this it is evident that in a certain number of cases of cholera the organism is carried by the blood-stream to the kidneys, where it is eliminated in the urine. From the point of view of prevention of the disease the above observation is obviously important, as it indicates another channel of escape of the cholera organism.

Major Greig's researches on the occurrence of the cholera vibrio in the biliary passages have a special importance because of the light they throw upon the question of "cholera carriers." As is well known, the typhoid bacillus reaches the bile passages probably by way of the blood, and, because bile forms a very suitable nidus for the growth of the germ, it tends to remain there, keeping up a certain amount of irritation,

which may result in the formation of gall-stones. The germs are voided in the stools constantly or intermittently. This voiding of virulent typhoid bacilli in the stools occurs only for a short time in the case of a majority of convalescents from typhoid fever. In a certain percentage, however, the discharge continues—it may be for as long as 20 years. Such individuals who continue to discharge typhoid bacilli in their stools are known as “typhoid carriers,” and they form a constant source of danger to the communities in which they reside. In a large number of instances, epidemics of typhoid fever have been traced to these carriers. Major Greig’s researches go to show that a very close analogy obtains between cholera and typhoid fever in this respect. The cholera germ was found in the bile in cases of cholera as far back as 1884 by Nicoti and Rietsch. This observation has since then been confirmed by a large number of investigators. Owing to the increase of cholera consequent upon the advent of some 300,000 pilgrims in the district where Major Greig was working, a large amount of material came under his notice. He made a bacteriological examination of the bile in 271 fatal cases and found the cholera organism present in 80 of these. Out of these 80 cases 12 showed definite pathological changes in the gall-bladder and bile ducts.

In another paper (*Ind. Journ. Med. Research*, vol. ii. No. 1) Major Greig deals in detail with the lesions found in the bile passages. In some cases the gall-bladder is distended, and may be found to contain pus; in other cases it is small and shrunken. The mucous membrane is red from congestion and hæmorrhage into the submucosa. Microscopically, the changes consist in a shedding of the epithelium covering the mucous membrane; the submucosa shows infiltration with inflammatory cells, both polymorphonuclears and mononuclears being present. Hæmorrhage into the submucosa may be met with. Cholera vibrios can be demonstrated chiefly in the deeper layers of the submucosa. Similar changes are found in the cystic and common bile ducts. In the liver a round cell infiltration of the portal tracts and between the liver cells is seen. In suitably stained specimens comma bacilli can be demonstrated in the liver substance.

In order to supplement the histological and bacteriological investigation of the gall-bladder and bile passages in cases of cholera the matter was submitted to the test of animal experimentation. Rabbits were injected intravenously with cultures of cholera vibrios. In a number of instances the germ was recovered from the bile. Microscopically, there was found in the wall of the gall-bladder shedding of the superficial epithelium and infiltration of the submucous layer with round cells and polymorphs. Similar changes were found in the bile passages and in the duodenum. In some cases the cholera organism was recovered in pure culture from the contents of the intestinal canal.

As regards the mode of entrance of the cholera bacillus into the

biliary passages, there are two possibilities: either they may enter from the intestine by way of the duodenum and common bile duct, or from the liver by way of the blood. It has been seen that the organism is carried by the blood-stream to the various organs, although the author has been unable to cultivate it from the circulating blood during life. On the whole, the author is inclined to admit the double path of entrance.

Turning to the more practical aspect of the question, viz. the bearing of these observations upon the dissemination of the disease, Major Greig gives us two papers—one upon the examination of the stools of cholera convalescents and contacts, and another upon an epidemic traced to a cholera carrier (*Lud. Journ. Med. Research*, vol. i. No. 1, pp. 59, 65). He examined bacteriologically the stools of a number of convalescents discharged from the Cholera Hospital. Out of 30 patients 11 were still excreting cholera vibrios. In other words, 36 per cent. of the cases were discharged from hospital in an infective condition. These patients, being pilgrims, on discharge, travelled all over India. The places to which they went were represented by such widely separated towns as Lahore and Madras, Bombay and Calcutta. The significance of this dispersion of potential foci of infection need not be dwelt upon. At the same time, a number of contacts were examined, with the result that out of 27 persons presenting no sign of the disease, 6 were found secreting living cholera vibrios in their stools. No doubt a certain number of these carriers would cease to harbour the germ after a time. Still some would probably develop into the chronic carrier, who would go on excreting the organism intermittently for long periods.

Devecchi and Randome have found that in 115 cases of cholera convalescents the duration of the vibrio in the stools varied between a minimum of 2 and a maximum of 35 days: and in 57 contacts the duration varied between 2 and 13 days. In exceptional cases the organism may be found 12 months after the attack. The excretion is irregular, there being bacilli-free intervals of 8 to 12 days. Major Greig has found that out of 11 cases examined daily for a considerable period, the vibrio remained for a long time in three. Two of these gave a very definite reaction with the sedimentation test against a standard strain of cholera vibrio.

Arising out of this investigation, the practical points are two in number. First, disinfection of fresh night-soil should be carried out as early and as extensively as possible. The author, from practical experience, has found that chlorinated lime (3.2 per cent. chlorine) is very effective. The second point is that cholera convalescents should be segregated, and that only after negative results have been obtained with repeated examination of the stools should they be discharged.

Lastly, Major Greig was able to trace an epidemic of cholera to a

“carrier.” The man was discharged from the Cholera Hospital on 6th July 1912. On 23rd July he was arrested and sent to jail. A bacteriological examination of the stools showed cholera vibrios in large numbers. A few days after the man’s admission cholera began to appear in one of the wards. Including warders, 17 cases of cholera with 5 deaths took place. The “carrier” was at once segregated, but the mischief had been done already. The outbreak was effectively controlled by a very complete disinfection of all fresh night-soil in the jail.

J. M.

LARYNGOLOGY, OTOTOLOGY, AND RHINOLOGY.

UNDER THE CHARGE OF

A. LOGAN TURNER, F.R.C.S., J. S. FRASER, F.R.C.S., AND
W. G. PORTER, F.R.C.S.

NON-SUPPURATIVE DISEASES OF THE INNER EAR.

It has often been stated that we owe many of the advances that have been made in medical knowledge to the French, and that later on German observers, by their painstaking methods, apply and extend the knowledge they have not originated. This is well illustrated in the case of non-suppurative disease of the aural labyrinth. As G. Alexander and von Eicken acknowledged at the Seventeenth International Medical Congress, the credit for the recognition of the symptom-complex due to disease of the labyrinth must be given to the Frenchman Ménière. Ménière’s classical case is described by Alexander as follows:—A young woman was exposed to severe cold on a night journey in winter during menstruation, and suddenly suffered from an attack of giddiness, vomiting, and total deafness. The patient died on the fifth day, and post-mortem examination showed that the central nervous system was normal, but that a red plastic exudate was present in the vestibule and canals on both sides. The cause of death was not discovered. Alexander thinks that the case was probably one of leukæmic hæmorrhage into the cochlea and vestibule. We now know that leukæmia may occur with changes in the bone-marrow and blood but without alteration in the spleen or lymph glands. In Ménière’s case the bone-marrow and blood were not examined. The case was probably not one of *sui generis* disease of the ear, as spontaneous hæmorrhage into the inner ear only occurs in bleeding diseases. Ménière thus showed that the sudden onset of deafness, combined with tinnitus, giddiness, disturbance of balancing, nausea, and vomiting, were associated with disease of the inner ear. Until Ménière’s observation, physicians had been inclined to regard giddiness of this type as proceeding from disease of the cerebellum. Hitherto no case similar to Ménière’s has been recorded, but F. Alexander and Mannasse have described a case which suffered from chronic progressive labyrinthine

deafness and suddenly had an attack of Ménière's symptoms; the patient died some days later of apoplexy. Examination showed bleeding in the cochlear and vestibular branches of the eighth nerve but no hemorrhage in the labyrinth. (The late Dr. Alexander Bruce and the abstractor have recorded a similar case.)

From the pathological point of view the eighth nerve and the labyrinth may be regarded as one, *i.e.* changes which occur primarily in the nerve and ganglion (toxic or infectious neuritis) very soon lead to changes in the neuro-epithelium. As a rule, also, destruction of sensory cells in the cochlea, as in traumatic injuries, are soon followed by destruction of the nerve and ganglia of that region. If the disease is confined to the cochlear or vestibular part of the labyrinth alone, the primary seat of the disease is really in the nerve (Ruttin). To explain the greater resistance of the vestibular apparatus, we must remember its phylogenetic age, its thicker nerve bundles, and its larger ganglion and sensory cells (Alexander). Wittmaack found after endocranial section of the eighth nerve in a cat a descending degeneration of the cochlear nerve and atrophy of Corti's organ. Here, again, the vestibular nerve was more resistant than the cochlear. On the other hand, in cases of congenital deafness the nucleus of the eighth nerve has been found normal in spite of complete loss of labyrinth function and marked atrophy of the nerve.

If one looks up "Non-Purulent Diseases of the Inner Ear" in a text-book of otology only ten years old, one finds short paragraphs on anæmia and hyperæmia of the labyrinth, increased labyrinth pressure in acute fevers, syphilitic diseases of the ear, a few words about gouty conditions, and a short section on Ménière's disease. As a contrast to this the present abstract is intended to give a short account of the papers by Alexander, von Eicken, and Gerber—papers which occupy eighty closely-printed pages in the *Transactions of the Otological Section of the Seventeenth International Medical Congress*.

Alexander divides the non-purulent diseases of the labyrinth into (A) Congenital Anomalies of the Labyrinth, and (B) Post-Embryonic Diseases. The latter are again subdivided into (a) Primary, and (b) Secondary Disease of the Inner Ear.

(A) CONGENITAL ANOMALIES OF THE LABYRINTH.

I. *Congenital Labyrinthine Deafness*.—This condition is often hereditary, and is sometimes combined with facial or other deformities, such as anomalies of pigmentation, or with brain disease, or hereditary syphilis. The pathological changes consist in hypoplasia of the spiral ganglion and peripheral parts of the cochlear nerve. Corti's organ and the stria vascularis show degenerative atrophy. Many cases are closely related to otosclerosis and to congenital cretinic deafness, in which congenital malformation of the cochlea and its nerve are the primary

changes; the alterations in the labyrinth capsule, characteristic of otosclerosis, may be present in embryonic life, or may only occur at a later period.

Symptoms.—If unilateral, congenital labyrinthine deafness may escape notice, unless the good ear becomes inflamed, or the deafness is discovered when the child lies with the healthy ear against the pillow, and is thus unable to hear. If the condition is bilateral, or if there are vestibular symptoms, such as loss of balancing, the condition is of course discovered at an earlier period. At puberty the hearing may get worse, and, in unilateral cases, the previously sound ear may be affected. Bilateral cases are, of course, unfavourable, as are those with affections of the vestibular apparatus.

Treatment.—Local treatment is not advisable, except in progressive cases, in which galvanism may be employed, the positive electrode being applied over the tragus or mastoid, while the negative pole is placed at the back of the neck. Internally, iodide, phosphorus, or anti-syphilitic treatment may be given.

II. *Congenital diseases of the static labyrinth* are rare. Some patients show absolute loss of reaction to rotation, but react to caloric or electrical stimulation. In other cases, especially those due to congenital syphilis, the fistula phenomenon may be present, *i.e.* nystagmus on compression or aspiration of the air in the external meatus. Beck holds that this is due to undue mobility of the stapes foot-plate.

III. *Progressive Labyrinthine Deafness of Youth.*—About the twentieth year a rapidly increasing deafness supervenes, and may lead to total loss of hearing. Functional examination in these cases shows nerve deafness. Politzer thinks this condition is due to idiopathic atrophy of the eighth nerve. The disease is confined to the cochlear division, and may be accompanied by disease of the optic and olfactory nerves. The condition may be associated with acromegaly or tower-skull, or leontiasis ossæa. The prognosis is bad and the treatment hopeless.

IV. *Congenital Cretinic Deafness.*—(Dealt with later under “Constitutional Diseases.”)

(B) POST-EMBRYONIC NON-PURULENT DISEASES OF THE LABYRINTH.

(a) *Primary Diseases of the Inner Ear.*

I. and II. *Acute and Chronic Traumatic Diseases of the Inner Ear.*—Single loud severe sounds, *e.g.* the explosion of shells, and continuous loud noise, *e.g.* in boiler-making and riveting, cause pathological changes in the ear. Wittmaack holds that the noises are conveyed by bone conduction, but Yoshii, Siebenmann, Nager, and von Eicken hold that air conduction of the loud sounds is the real cause of the deafness. Wittmaack, again, holds that the trouble begins in the ganglion cells, and that the changes in Corti’s organ are secondary. In his opinion, the pathology of professional deafness (boiler-maker’s deafness)

is the same as that of senile or arteriosclerotic affections, and of infectious, cachectic or diabetic neuritis. Bezold, Siebenmann, Yoshii, and von Eicken, on the other hand, believe that the sounds are conveyed by air conduction; they have found from experiments on guinea-pigs that the changes begin in Corti's organ, and are more or less localised to the part of the cochlea which corresponds to the sound causing the deafness, *e.g.* there is degeneration in the basal part of the cochlea when the deafness is due to sounds of high pitch, and degeneration nearer the apex of the cochlea when the deafness is produced by loud tones of a low pitch. They thus confirm Helmholtz's theory of hearing. Hegener found that after exposing himself for a long time to the tone 10,000 D.V.S. he was deaf for thirty-six hours afterwards to this tone, and suffered from high pitched tinnitus; he only slowly recovered. Von Eicken, in his experiments on guinea-pigs, removed the incus on one side. After prolonged exposure to noise the animals were killed and microscopic examination showed that there were no labyrinthine changes in the side of operation, whereas the cochlea on the side of the normal middle ear showed marked degeneration. Reinking has recorded two cases of professional deafness in patients, each of whom had a unilateral middle ear affection. Functional examination showed that the professional deafness was confined to the side with the healthy middle ear. On the other side there was no loss of perception for the higher tones. Habermann has examined the inner ear in cases of boiler-maker's deafness and has found degenerative changes in the cochlea, especially in the hair cells, and also in the ganglion cells. The *treatment* is preventive, but von Eicken states that cotton-wool alone is of no use as an ear-plug, as it does not produce a sufficiently firm closure of the meatus. Cheatle recommends plugs made of a mixture of jeweller's wax and cotton-wool. Up to the present time there have been no microscopic examinations of the inner ear in cases of deafness due to explosions, *e.g.* the bursting of high explosive shells, but the primary changes are probably in Corti's organ. (The present war will probably provide numerous opportunities for the microscopic examination of such cases.)

Telephone deafness may occur from degenerative changes in the cochlear apparatus, especially in neurotic people. Blegvad found that healthy girls engaged in telephone work did not suffer, but that neurotic operators complained of headache, tinnitus, a feeling of fulness and pressure in the head, and of excessive irritability to sounds. Blegvad admits that sudden loud sounds and lightning may cause organic injury in telephonists. Mauthner holds that in traumatic affections not only the ear but also the brain is affected.

After death from *caisson disease* Alt has found hyperæmia of the labyrinth and small hæmorrhages. (Air embolism could not be found by microscopic examination, although it is probably the real cause of the disease.—Abstractor.)

Traumatism.—Stenger has experimented on rats and has divided traumatic affections of the inner ear into (1) those with injury of the bony labyrinth capsule, and (2) those without such injury. The latter, (2), are regarded as cases of concussion, and on microscopic examination hæmorrhages are found in the nerve structures. It is possible that variations in pressure in the labyrinthine fluids may also produce symptoms in these cases. From the medico-legal point of view, cases of this sort occurring in men should be investigated as soon as possible after the injury. Rhese has examined a hundred people immediately after head injuries (concussion) and found that they showed nystagmus on looking to the non-injured side, giddiness, disturbance of balancing, tinnitus, shortened air and bone conduction for all forks, diminished hearing distance for the watch, exhaustion phenomenon of the acoustic nerve, marked positive Rinné in the affected ear, injection of the superior wall of the external meatus, and ecchymoses or blood crusts on this wall and on the tympanic membrane. The giddiness and disturbance of balancing may remain for years and be combined with tachycardia and vasomotor disturbances. Formerly it was thought that in cases of *fracture of the base* the inner ear only suffered molecular injury, but we now know that hæmorrhages in the labyrinth are the chief cause of the symptoms. Sokai has examined the ear of five patients who died from fracture of the base without fracture of the labyrinth capsule, and found hæmorrhage in various parts of the inner ear and laceration of the nerve structures. If such cases survive at the time but die later on from other causes, one may find disappearance of the spiral ganglion cells, new connective-tissue formation in the basal coil of the cochlea, œdematous degeneration of the spiral ligament, and some atrophy of Corti's organ. Lermoyez and Hautants have pointed out that if, after injury to the head followed by deafness, we find that the vestibular apparatus reacts, we must *not* regard it as a proof of absence of injury to the labyrinth.

Fractures of the labyrinth capsule often cause marked hæmorrhages, which may act mechanically and give rise to immediate deafness, or may lead later on to degeneration of nerve structures. Manasse has divided severe labyrinthine injuries in fractures of the base into three stages: (1) Fissure of labyrinth capsule affecting the vestibular apparatus; this heals by connective tissue and only rarely by bone. (2) New formation of bone in the labyrinth due to periostitis ossificans following the fracture. (3) Secondary degenerative atrophy of nerve structures.

Treatment.—Voss is in favour of the operative treatment of fractures of the cranial base involving the labyrinth, but it is probably better not to interfere. Alexander advises complete rest, ice-bags, and narcotics. Pilocarpine may be useful later on.

Many cases of *sea-sickness* belong to the traumatic form of labyrinth

affections. Irritation of the otolith membranes in the sacculæ and utricle are apparently a cause of sea-sickness. Wittmaack has produced loosening of these membranes in guinea-pigs by very rapid rotation—2000 per minute. The animals were at first very giddy, but recovered. Wittmaack found that after such experiments nystagmus due to ordinary rotation could not be produced; later this also recovered. After these experiments Wittmaack found no disturbance of hearing and no injury to the canals.

Barany has stated that if he were lying down during a voyage he found that vertical movements of the ship were not unpleasant, but that if he raised his head he felt sick at once.

III. *Anomalies of Metabolism.*—Wittmaack has described degenerative neuritis in cases of diabetes mellitus—the cells of the spiral ganglion being first affected. A similar neuritis has been described in gout and in cancerous cachexia.

IV. *Diseases of the Blood and Blood-Forming Organs.*—Lymphomatous hæmorrhages in the labyrinth may be circumscribed or diffuse. They may occur in the labyrinth alone, or may be combined with bleeding into the middle ear or brain. The blood in the membranous labyrinth may compress the nerve structures or hæmorrhage may occur around the eighth nerve. The labyrinthine bleeding may interfere with the lymphatic circulation and may lead to dilatation of the sacculæ or of the cochlear canal. Degenerative changes follow in the nerve apparatus, accompanied by the formation of new connective tissue and bone. Inflammatory changes may take place in the hæmorrhagic exudate. Labyrinth disease is common in acute leucocythæmia, and only slightly less common in myelogenous, lymphatic, or mixed leucæmia and chloroma. In chronic leucæmia and lympho-sarcoma the inner ear is less often involved.

Symptomatology.—Circumscribed hæmorrhages may cause no symptoms, but large hæmorrhages cause deafness and loss of the vestibular function.

V. *Constitutional Diseases.*—In rickets, anæmia of the labyrinth is evidenced by subjective noises and disturbance of hearing.

Endemic Cretinism.—Alexander himself has investigated this condition in Styria and has found that deafness is very frequent in cretins. Hardly one quarter of the cretins have normal hearing, while 30 per cent. are markedly deaf and 5 per cent. are quite deaf. The deafness in most cases is congenital or occurs in earliest childhood. In others the deafness and other cretinic symptoms come on after an acute infectious disease. Bloch believes that the deafness is due to dysthyroidism. The complete dwarf type of cretin often suffers from severe deafness, but among the dwarf half-cretins severe deafness is not met with. Cretins with large goitres are all more or less deaf, but complete absence of hearing is rare, though some cases are deaf-mutes.

Pathology.—Many cases show catarrhal changes in the middle ear. Swelling of the mucosa of the naso-pharynx and Eustachian tubes, and enlarged tonsils, are commonly met with. The niches of the round and oval windows may be filled up by œdematous connective tissue. The changes in the inner ear consist in a degenerative atrophy of the cochlear nerve and of the nerve endings in the labyrinth. As a rule the changes are only found in the sacculus and cochlea, *i.e.* in the pars inferior of the labyrinth, though in some cases the vestibular apparatus (pars superior) is also affected. Alexander found in the labyrinth capsule in one case with marked labyrinthine deafness the condition known as otitis vasculosa—the early stage of otosclerosis—along with atrophy of the eighth nerve. Microscopic examination of congenital cretinic deafness has shown complete obliteration of the membranous labyrinth, with aplasia of the nerve endings, and dwarfing of the eighth nerve. In other cases degeneration of the stria vascularis and septum formation in the cochlear canal have been found—conditions similar to those in waltzing mice, congenital deaf-mutes, and albinotic cats and dogs. The connective-tissue structures of the labyrinth may participate in the degenerative changes, *e.g.* atrophy of the spiral ligament and proliferation of connective tissue enclosing the atrophied spiral ganglion. No changes have been found in the basal nuclei of the eighth nerve, in the nerve tracts, or in the temporo-sphenoidal lobe.

Symptoms.—Giddiness and subjective noises are rare, while functional examination is difficult on account of the mental condition of the patients. The gait of deaf cretins is often distinctive; they walk in a seraping, fumbling manner, but broad-based progression is only found in those cases with affection of the vestibular apparatus. The reflex irritability of the static labyrinth is usually normal—in some cases it is even increased.

Treatment.—Thyroid extract does good and acts very quickly in cases of dumbness due to psychic causes, but is useless in cases of cretinic deafness due to labyrinthine defects. J. S. F.

(*To be continued.*)

NEW BOOKS.

Diagnosis and Treatment of Digestive Diseases. By G. M. NILES, M.D.
Pp. xii. + 597. With 87 Illustrations. London: Henry Kimpton.
1914. Cloth, price 21s. net: quarter bound Persian, gilt top,
25s. net.

THIS work, intended as a practical treatise for students and practitioners of medicine, is written by an American author of wide experience in the subject which he professes. He takes occasion to state in his preface that it is not his purpose "to assist in the erroneous move-

ment for divorcing gastro-intestinal diseases from the broad field of internal medicine to which they rightfully belong."

The aim, admirably attained, has been to provide a book of a reliable kind which deals concisely with diagnosis and exhaustively with therapy.

The author has the gift of clear and expressive language, so that his ideas are "apprehended with the least possible mental effort."

The book is divided into two parts—one dealing with general diagnosis and treatment of digestive diseases, and the second with special diagnosis and treatment of digestive diseases.

It is impossible in the space of a brief review even to mention many of the excellent features of this book, but for the sake of those who are interested in the subject it is necessary to convey the impression that the author has large experience, is a capable observer, and is bold enough to express independent conclusions. The illustrations are well chosen and excellent.

Lead-Poisoning: From the Industrial, Medical, and Social Points of View.

By Sir THOMAS OLIVER, M.D. Pp. x. + 294. London: H. K. Lewis. 1914. Price 5s.

THE volume consists of a series of lectures delivered at the Royal Institute of Public Health. The author has tried to show the channel by which lead gains entrance into the body, the effects of the metal upon the body, and how these effects may be got rid of. Sir Thomas Oliver is so well known as an expert in all that pertains to dangerous trades that we felt sure that the subject of lead-poisoning would be dealt with in a masterly manner, and we have not been disappointed. The work will prove of the greatest value not only to medical officers of industrial works but also to the general practitioner, who never knows when he may be called upon to diagnose and treat a case. Lead and its salts are employed so extensively in arts and manufactures that many people are exposed to the risk of poisoning, and cases are narrated where face powders and hair dyes have given rise to dangerous and even fatal consequences. Some years ago it was shown that in 111 industries lead was employed. Since that time many new trades have been developed in which lead is employed, and so the risks of lead-poisoning have proportionally increased.

It is interesting to note that the number of cases of poisoning from white lead in Great Britain amounted in 1900 to 358, with 6 deaths, while in 1912 there were but 23 cases, with no deaths. The author points out that care must be taken not to mistake the toxic effects of the vapour of turpentine, benzene, or petroleum spirit which is evolved during the drying of paint with those due to lead.

As regards the treatment, the most interesting point is the employment of the double electric bath devised by the author along with Mr. T. M. Clague, and which seems to be most effectual.

Practical Pediatrics. By JAMES H. M'KEE, M.D., and WILLIAM H. WELLS, M.D. With an Appendix on Development and its Anomalies, by JOHN MADISON TAYLOR, A.M., M.D. Vol. I., pp. xiv. + 546; Vol. II., pp. x. + 547-1182. London: Henry Kimpton. 1914. Price £2, 10s. net.

THIS text-book is an expansion of a previous work by Drs. Taylor and Wells. The earlier book was not in all respects satisfactory, and we regret to say that a similar verdict must be passed on these pretentious volumes. The test which anyone with knowledge of diseases of children applies to a new text-book is not to inquire whether it contains a full description of medical diseases in general, but to ask whether it gives an adequate account of the diseases common in or peculiar to children. In this book we find that only one page and two lines is devoted to hypertrophy of the pylorus, whereas gastric and duodenal ulcers receive three and a half pages; chlorosis and pernicious anemia get four pages each, splenic anemia only one and a half; acute pyelitis, one of the most striking and characteristic urinary affections of infants, receives much less notice than calculus or cirrhotic Bright's disease. The description of hysteria is on hackneyed lines, and takes no account of the peculiarities of this condition in childhood. Other instances might be given, but these are perhaps sufficient. There are numerous illustrations—good, bad, and indifferent. We do not think that this book in any way represents modern American work on pediatrics, and we cannot recommend it.

Mentally Defective Children. By ALFRED BINET and THOMAS SIMON, M.D. Authorised Translation by W. B. DRUMMOND, M.B., F.R.C.P.(Edin.). With an Appendix by MARGARET DRUMMOND, M.A. Pp. viii. + 180. London: Edward Arnold. 1914. Price 2s. 6d. net.

THIS is an extremely fascinating book, which will be found most useful and interesting by all doctors and teachers whose work brings them in contact with backward children. Most of us have become familiar with the names of MM. Binet and Simon through their well-known tests, but it is not so generally known that the invention of these tests is a relatively unimportant part of Binet and Simon's work, and that most of their conclusions as to defectives are arrived at quite independently of the psychological examination these tests imply. The authors insist strongly that the recognition of defective children is primarily a matter for the school teachers and inspectors, and that the medical examination is secondary and only comes into operation on material which has first been sifted out by the educationalist. The practical experience which the authors possess is shown by the way in which they are able to pick out the mistakes which both teachers and doctors are likely to commit, partly from lack of special knowledge,

and partly from professional predilection, in selecting and grading backward children. Defectives are divided into three groups—the mentally defective, the ill-balanced, and the mixed type. The pedagogic test is fundamentally simple—it is the retardation in years which a child displays, as gauged by its age compared with the class in which it is placed. Conventionally, a child who shows a retardation of three years when he himself is nine years of age or more is regarded as mentally defective. The comparatively subordinate position of the medical examination of defectives may arouse some opposition in the mind of the medical reader, but reflection will show that this is unjustified—all that MM. Binet and Simon ask is that the doctor should stick to his last, and allow that the educational management of these children is a purely educational problem, to which medicine may contribute in the same way as it does to the education of normal children, by attending to their physical well-being.

The book thoroughly merited translation, and deserved to fall, as it has done, into competent hands, for Dr. Drummond is himself an authority on the subject, and has most successfully interpreted MM. Binet and Simon to English readers. Miss Drummond's Appendix enhances the value of the volume. We are sure that the book will be widely read.

The Vaccination Question in the Light of Modern Experience. By C. KILLICK MILLARD, M.D., D.Sc. Pp. xviii. + 242. With 9 Illustrations. London: H. K. Lewis. 1914. Price 6s. net.

IN this volume Dr. Millard explains at length his position with regard to compulsory infantile vaccination. His thesis briefly is this, that most outbreaks of smallpox are due to unrecognised mild cases, and that such cases are largely due to the protection afforded by vaccination in infancy. In unvaccinated persons, on the other hand, the disease, in his opinion, is usually sufficiently severe to be easily recognisable, and the possibility of extensive dissemination of infection is much reduced in these days of systematic shadowing of contacts and prompt vaccination or quarantine. Although there is much truth in his unorthodox contention, we consider that Dr. Millard will please neither party in the vaccination controversy. A firm believer in the temporary protection conferred by vaccination, he cannot expect the support of the anti-vaccinists, who, he remarks, are unorthodox in other questions besides that of vaccination, and whom many of us believe to be "cranks." On the other hand, the orthodox school, in which we must still class ourselves, even after a most careful study of the very interesting material so ably reviewed by Dr. Millard, will still prefer to work for what he considers the impossible end of universal revaccination on the German system. We cannot, in the space allowed us, enter into points so controversial as his book raises. But we still believe

that sooner or later an outbreak will get out of hand even in Leicester, although the revaccination now being carried on for military purposes and likely to be applied to two and a half millions of men may help to postpone the evil day.

Handbook of Obstetrics for Students and Junior Practitioners in India. By KEDARNATH DAS, M.D., Teacher of Midwifery, Campbell Medical School; Obstetrician and Gynaecologist to the Campbell Hospital, Calcutta, etc. Pp. xix. + 612. With 376 Illustrations. Calcutta: Butterworth & Co. (India), Ltd. 1914. Price 14s. net.

DR. KEDARNATH DAS' book on midwifery is noteworthy in two senses, first as being the work of an Indian obstetrician for Indian students and therefore a new departure, and, second, for its own excellence and careful adaptation to the purposes for which its author designed it. It is not an elaborate treatise, and yet one finds in it many things which the ordinary medium-sized text-book does not contain. As an instance of what is meant, the references to obstetrics in the Ayurveda may be mentioned. With respect to the views expressed by Dr. Das on the various subjects discussed, it must suffice to say that we have looked up a number of leading problems about which there is difference of opinion and have always found the advice he gives to the student and junior practitioner sound and well-balanced. A word of praise is due to the publishers for the way in which they have produced the work; and the illustrations, although mostly borrowed from standard works of other authors, have been carefully chosen, and are generally clear and full of teaching. It would be well if in a future edition the author emphasised the length of time which it is necessary for a patient suffering from phlegmasia alba dolens to spend in bed before she can safely move about. There are other minor matters which invite criticism, but the general impression left on the mind is a reliable book, well adapted to its professed purpose.

Anæmia and Resuscitation: An Experimental and Clinical Research. By GEORGE W. CRILE. Pp. 305. With 12 Illustrations. New York and London: D. Appleton & Co. 1914. Price 21s. net.

IN this interesting monograph Dr. Crile describes the results of extensive experimental and clinical researches on the effects of local anæmia on various organs and tissues. In the experimental work the assistance of several associates is acknowledged.

The investigations include observations on anæmia of the central nervous system, of the voluntary muscles, of the small intestine, and of the kidneys and spleen. The experimental work is recorded in great detail, and that on the small intestine and on cerebral anæmia is particularly suggestive. A striking point brought out is the wide difference existing between the various organs as regards their power

of recovery after temporary anæmia. Parenchymatous cells are much less resistant than the connective tissues. Brain cells are irretrievably damaged after a few minutes of total cerebral anæmia, whilst skin and bone may remain unharmed after several hours.

The author's method of resuscitation is directed towards restoring the circulation through the brain as soon as possible. It is only available in cases of emergency in hospital practice. Briefly, it consists in rhythmic pressure over the thorax and upper abdomen, together with the infusion of normal saline with adrenalin, the cannula being inserted into an artery, and the stream directed towards the heart. By these means the blood pressure is raised in the coronary arteries and the heart is encouraged to beat. If the circulation has been arrested for more than seven minutes, in cases of apparent death by chloroform overdose, recovery is exceptional. In comparing the experimental with the clinical results Crile is convinced that the human heart is as readily resuscitated as the dog's.

The Tonsils: Faucial, Lingual, and Pharyngeal. By HARRY A. BARNES, M.D. Pp. 160. With 39 Illustrations. London: Henry Kimpton. Glasgow: Alexander Stenhouse. 1914. Price 12s. 6d. net.

THE book under review represents a very readable account of our present state of knowledge of the tonsils. The section upon the anatomy and histology of the tonsils is very well illustrated by numerous photomicrographs, which give a very good idea of their structure. The writer brings out a point in connection with the anatomy of the tonsils which is not generally known, viz. that the faucial, lingual, and pharyngeal tonsils are analogous with the solitary glands and Peyer's patches of the intestine in that they lie actually within the mucous membrane. He shows that the capsule of the faucial tonsil is directly continuous with the fibrous layer of the mucous membrane of the mouth; thus the tonsil may be said to lie in the mucous membrane. This also applies to the lingual and pharyngeal tonsils.

On the other hand, the supratonsillar fossa is not described with the care that one would expect, considering its pathological importance.

As regards the operative technique for removal of the tonsils, the author enucleates the tonsils in all cases by means of dissection with knife and snare. The patient is anaesthetised with ether, and the operation is performed in the upright position. Sluder's method of tonsillectomy is described in the originator's own words.

It is somewhat disappointing to find that only one small paragraph is devoted to the relation of the tonsils to the singing voice.

In conclusion, the book is one which will be perused with advantage by all who are interested in the subject.

Serology of Nervous and Mental Diseases. By D. M. KAPLAN, M.D.
Pp. 346. Illustrated. Philadelphia and London: W. B. Saunders Co. 1914. Price 15s. net.

THIS monograph consists of four sections. The first part, which is devoted to technique, embraces the history of lumbar puncture, the anatomy and physiology of the cerebro-spinal fluid, the operation of lumbar puncture, the physical, chemical, and cytological features of the cerebro-spinal fluid, and the technique, modification, and significance of the Wassermann reaction. In the second and third parts the serology of the non-syphilitic and syphilitic nervous and mental diseases are considered, while the fourth part deals with salvarsan therapy.

A bibliography, which occupies 70 pages, is appended.

The work, by the Director of the Research Laboratories of the New York Neurological Institute, is the first complete monograph of its kind in the English language, and will prove of great value to those interested in this department of medicine.

NEW EDITIONS.

A Short Handbook of Cosmetics. By Dr. MAX JOSEPH, Berlin. Second English Edition, Revised, with Appendix. London: William Heinemann (Rebman, Ltd.). 1914. Price 2s. 6d. net.

MOST English readers understand by "cosmetics" powders and paint used for personal adornment: but on the Continent the word has a wider signification, and embraces all knowledge of the hygiene of the skin and hair, with the treatment of their minor affections. The book before us is meant to instruct in such matters, and the advice given is in the main sound. Were one critical one might complain of the brevity of the directions for the employment of the methods recommended. Error could easily arise in consequence. Many of the formulæ seem to us unnecessarily complex, while the English equivalents for the metric system are not, in all instances, correct. The translator has added a short appendix with some useful hints.

Elements of Surgical Diagnosis. By ALFRED PEARCE GOULD. Fourth Edition. Edited by ALFRED PEARCE GOULD, F.R.C.S., and ERIC PEARCE GOULD, F.R.C.S. Pp. 706. Illustrated. London: Cassell & Co., Ltd. 1914. Price 10s. 6d. net.

IN this new edition the section on abdominal diagnosis has been rewritten and revised, and there have been added diagrams, and also some excellent skiagrams, pyelograms of collargol injections into the pelvis and ureter of the kidney. The Basle nomenclature is also given in brackets occasionally, but not sufficiently for the student now starting surgery.

One has nowhere seen such excellent chapters on the differential

diagnosis of tumours, and those on abdominal conditions also merit the highest praise, and should be invaluable to all students and practitioners, even although they cannot understand some of the rest of the book; *e.g.* the chapters on the nervous system are much too intricate for the student, but might delight the specialist on that subject. The chapter on breast conditions might have been more extensive, and one misses there the condition of intra-canalicular fibroma, the most difficult disease to differentiate from scirrhus. The authors are rather apt to use long words and terms where simpler ones would do, *e.g.* "traumatopnoea," "hamarthrosis," "neuro-mimesis," "osteocopic," etc. The only error observed, probably "printer's," is "paineum" on p. 670 for perineum. There is also an excellent index to the book.

A Text-Book of Practical Therapeutics. By HOBART AMORY HARE, M.D., B.Sc. Fifteenth Edition. Pp. 998, with 151 Illustrations. London: Henry Kimpton. 1914. Price 21s. net.

A book which has reached its fifteenth edition does not require any special recommendation. In the present issue not only has the text been revised and brought up to date, but certain articles, such as those on salvarsan and neo-salvarsan, tuberculin, anaesthetics, and digitalis, have been entirely rewritten in order to bring the book into line with the most recent views on these subjects. It is just the kind of book the general practitioner wishes to have beside him if he desires to treat his patients on scientific lines and on common-sense principles.

Practice of Surgery. By J. G. MUMFORD, M.D. Second Edition. Pp. 1032, with 683 Illustrations. Philadelphia and London: W. B. Saunders Co. 1914. Price 30s. net.

It is four years since the former edition appeared. By suitable alterations and additions the subject-matter has been brought up to date. The text has been extended by 16 pages, but the number of illustrations, which are mostly excellent in quality, remain the same. The text-book is designedly of clinical and practical type, and the various subjects are not necessarily discussed from a systematic point of view. As far as possible the author describes the surgical affections in order of their importance, and space is not wasted on rarities. Certain subjects of importance seem to have been overlooked. One would expect to find in a text-book of this size at least a short description of Potts' disease of the spine and some details about the surgery of the semilunar cartilages. Such omissions are, however, infrequent, and the author may be complimented on producing a text-book which serves as a reliable guide to the practice and teaching of modern American surgeons, and which bears more of the stamp of originality than is usual in this class of publication.

Local Anæsthesia. By HEINRICH BRAUN. Third Revised German Edition, Translated and Edited by PERCY SHIELDS, M.D., A.C.S. Pp. viii. + 399, with 215 Illustrations. London: Henry Kimpton. 1914. Price 21s. net.

THE author's object in bringing out this somewhat formidable-sized volume has been to collect and place before the medical public such scattered knowledge as there is at present on the subject of local anæsthesia. The writer remarks that the subject is absolutely inadequately and superficially treated in the average surgical text-book, whereas the special monographs usually overestimate the value of one particular method. It is pointed out that besides an intimate knowledge of the innervation of each operative field, every tissue and part of the body requires a particular and definite technique for successful anæsthesia.

This volume may be said to cover the whole subject of local anæsthesia, containing as it does chapters on the history of its use, sensation and pain, and the effect of osmotic tension of watery solutions, besides dealing very fully with what we are apt to consider the more practical part of the subject.

Perhaps the feature of the book which will appeal to the greatest number is the large amount of space—nearly half the volume—which has been given to the minute description of the technique required for operations in different parts of the body. These descriptions are clearly worded, and are further elucidated by numerous illustrations. That Professor Braun has brought his methods wonderfully near perfection may be judged from some of the photographs taken during the course of operations in which the patients are evidently no more than mildly interested by the removal of large portions of their anatomy.

Without wishing in the slightest to depreciate Professor Braun's results, we cannot help feeling that the success, or even possibility, of an operation under local anæsthesia depends, other things being equal, on the temperament of the patient. We have ourselves seen operations performed under local anæsthesia on patients in Germany and Switzerland which patients in this country, even under exactly similar conditions, can seldom if ever be brought to tolerate.

Except that we can find no reference to the use of quinine and urea hydrochlorate as anæsthetic agents, this book seems as complete as is possible to make it. The printing is large and clear, and the illustrations numerous and good. The book should meet with a very ready acceptance at the hands of all surgeons and practitioners alike who have any call to make use of local anæsthetics.

We wish particularly to congratulate Mr. Percy Shields on his most admirable translation from the original German, and trust the book will meet with the success it deserves.

Urgent Surgery. By FELIX LEJARS. Translated by WILLIAM S. DICKIE, F.R.C.S. Vol. I. Third Edition. Pp. 599. Bristol: John Wright & Sons, Ltd. 1914. 25s. each volume.

M. LEJARS gives us the results of a wide experience in emergency surgery. Most space is devoted to a description of the surgical procedures pure and simple, but, where necessary, diagnosis is also considered in deciding between different lines of treatment. The book is therefore eminently practical, and will be useful not only to surgeons but also to general practitioners who have to deal with urgent surgical conditions.

The whole tone of the book is excellent, and the clear and thoroughly practical way in which it is written is worthy of the highest praise. Mr. Dickie has endeavoured to retain the French spirit as far as possible in the translation, and his success in so doing adds considerably to the interest and attractiveness of the book. The illustrations are numerous and good. The only point open to criticism is the excessive number of foot-notes, which are somewhat irritating to read and in many cases appear unnecessary.

The fact that this work is in its seventh French and third English edition speaks for itself, and we have no hesitation in warmly commending it as a clear and comprehensive guide to emergency surgery.

The Blood: A Guide to its Examination and to the Diagnosis and Treatment of its Diseases. By G. LOVELL GULLAND, M.D., F.R.C.P.E., and ALEXANDER GOODALL, M.D., F.R.C.P.E. Second Edition. Pp. xvi. + 384. Edinburgh: W. Green & Son, Ltd. 1914. Price 15s. net.

THE favourable reception which we predicted when the first edition of this excellent handbook appeared has evidently been realised, for a second edition has been called for within two years. Although the revision has been thorough, it has only been necessary to add some fifty pages, so that the book remains of moderate size. The chief additions cover descriptions of new counting apparatus, dark-ground illumination, the oxydase reaction, and von Schilling-Torgau's work on the structure of red blood corpuscles. We are glad to notice that although the refinements in structure of the leucocytes in leucæmia which have been made out by modern staining methods are fully described, they are subordinated to the more familiar and clinically useful grouping of these cells which has served well in the past. In addition to these new features, however, there are evidences on almost every page of revision in points of detail, and the book has been brought up to date in every particular. We can only repeat what was said when the first edition was noticed in these pages—that Drs. Gulland and Goodall's book is the best presentment of its subject in the English language.

FOREIGN BOOK.

Diagnostik der Nervenkrankheiten. Von Prof. Dr. ALEXANDER MARGULIES. Erster Band. Allgemeiner Pathologischer Teil. Ss. 120. Mit 13 Abbildungen. Berlin: S. Karger. 1914. Preis 3 M.

IN this little book the author gives a brief sketch of the leading symptoms and signs met with in diseases of the nervous system. The disturbances of movement, sensation, and of the reflexes, the diseases of the brain, cerebellum, cranial nerves, spinal cord and sympathetic system, the examination of the cerebro-spinal fluid and disturbances of the internal secretions and their influence on the nervous system are discussed in successive chapters.

NOTES ON BOOKS.

MOST clinicians who have fairly tried radiography in the diagnosis of pulmonary disease will agree that it gives information of great value, and in many cases detects lesions which would otherwise escape notice by the usual methods. As we believe that radiography deserves to be more widely used, we welcome Dr. Cooke's book on *The Position of the X-Rays on the Diagnosis and Prognosis of Pulmonary Tuberculosis* (Gilmour & Lawrence, Ltd., Glasgow) as a short, clear guide to the subject.

As usual, *The Practical Medicine Series of Digests* is excellent. Volume I, on "General Medicine" (Chicago: The Year-Book Publishers), for 1914, is now before us. The editors' names—Frank Billings, M.D., and J. H. Salisbury, M.D.—are guarantee of its quality. We may remind our readers that ten volumes of this series, covering the various departments of medicine and surgery, are issued annually at the price of 10 dollars, but that each volume is purchasable separately.

Tomes' *Dental Anatomy* (J. & A. Churchill, price 15s. net) has been so long and favourably known to successive generations of students of human and comparative odontology that it is scarcely necessary to do more than accord a welcome to the seventh edition, in the production of which Drs. Marett Tims and Hopewell Smith have collaborated with the author. The book has been rearranged in accordance with modern views and much new matter has been added, bringing it thoroughly up to date. Particularly noticeable are the sections on the development of the human jaws and on the teeth of prehistoric man. Owing to the practical importance of the subject to the dental student, we would suggest that in the next edition the chapter upon the teeth of man should be considerably extended. Although still marred by a number of misprints, the book has been greatly improved by increasing the size of the page and enlarging the type. It still remains the best of its kind in the English language.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES.

Appointment. DR. GEORGE LOVELL GULLAND has been elected to fill the Chair of Medicine in the University of Edinburgh, rendered vacant by the resignation of Professor Wyllie.

CASUALTIES.

LOST, with H.M.S. *Formidable* on 1st January, Surgeon WILLIAM MELLIS MEARNS, R.N., M.B., Ch.B., Aberdeen.

Surgeon Mearns was educated at the University of Aberdeen, and entered the Navy in 1908.

DIED of wounds received in action, Lieutenant WILLIAM EBENEZER MAITLAND, M.B., Ch.B.

Lieutenant Maitland graduated M.B., Ch.B., in the University of Glasgow in 1913. He resigned the post of House-Physician in Glasgow Royal Infirmary to take a commission as Second Lieutenant in the Third Battalion of the Seaforth Highlanders.

DIED of wounds, Lieutenant CHARLES COCHRANE ILES, R.A.M.C., M.D.

Lieutenant Iles graduated M.B., Ch.B., in the University of Edinburgh in 1910, and M.D. in 1912.

University of Edinburgh
"Roll of Honour." THE Roll of Honour just issued by the University, although not a complete list of those of its members who are serving in the War, is a striking proof of the way in which the educated and professional class has answered its country's call in the hour of need. The total number of names in the list is 2617, of whom 1679 are serving with the colours, 588 are cadets in the Officers' Training Corps, and 350 are in the University reserve. The Army Medical Service claims most names—691; the infantry comes next with 544, of which 322 are in the commissioned ranks; and the artillery third, with 191. The Navy has

representatives in its combatant and non-combatant branches, and University men are serving on the staff, as chaplains, in the cavalry, engineers, service corps, and veterinary corps.

The historian of the future may be left to find an appropriate name for this conflict waged in three Continents and overseas by eight powers and many nations—for this generation it will be just “the War”; and to glance down the list of names is to realise how truly a University such as ours draws its scholars from a whole Empire, and to see that everywhere in “our far-flung battle line” they are doing their duty. Among honorary graduates are a Field-Marshal, the Minister for War, and the General Commanding the South African Forces. From these, down to troopers and privates, almost every combatant rank in the Army is represented; University men are serving as despatch riders, in the Flying Corps, in the Royal Naval Motor-boat Reserve, in the Naval Brigade, as interpreters, as censors, and as chaplains. Their names appear in the great colonial contingents—Canadian, Australian, and New Zealand, and in such local colonial forces as the Imperial Light Horse and similar troops all the world over; one of our students is a volunteer in the French Army. In the army medical service we have the Deputy Director General, Expeditionary Force, specialists attached to the great base hospitals, and to the Expeditionary Force for special duty; all ranks in the Royal Army Medical Corps, surgeons in charge of hospitals under the British and French Red Cross, surgeons to hospital ships, surgeons attached to field ambulances, to the colonial forces, down to privates and orderlies in the R.A.M.C., troopers in field ambulances, and the staffs of the Indian ambulances. Geographically, the list extends beyond the confines of the Empire. France, Belgium, Serbia, Egypt, Malta, Gibraltar, St. Helena, the West Indies, India; South, West, and East Africa; Togoland, Nyasaland, the Cameroons. Everywhere where fighting is, except Russia, an old Edinburgh student is there.

**Belgian Doctors' and
Pharmacists' Relief Fund.**

THE Scottish Committee of the above fund has now been formed and includes the Scottish representatives on the General Committee:—The Presidents of the three Scottish Medical Corporations; Sir Thomas R. Fraser, M.D., Professor of Materia Medica, Edinburgh University; David Gilmour, Dunfermline, Member of Council, Pharmaceutical Society; J. Rutherford Hill, Resident Secretary, Pharmaceutical Society, Edinburgh; Sir Donald MacAlister, K.C.B., Principal of Glasgow University; J. Y. Mackay, M.D., Principal of University College, Dundee; J. C. McVail, M.D., Crown Nominee on General Medical Council; William Russell, M.D., Professor of Clinical Medicine, Edinburgh University; Norman Walker, M.D., Treasurer, Royal College of Physicians, Edinburgh. Also the following medical men

and pharmacists :—John Adams, M.B., Glasgow, Member of Council, British Medical Association ; Sir Geo. T. Beatson, K.C.B., Chairman, Scottish Branch British Red Cross Society ; Sir Halliday Croom, M.D., Professor of Midwifery, Edinburgh University ; W. G. Dun, M.D., Treasurer, Royal Faculty of Physicians and Surgeons, Glasgow ; James L. Ewing, LL.D., Edinburgh, Member of Pharmaceutical Society ; J. P. Gilmour, Glasgow, Chairman of Executive, N. B. Branch, Pharmaceutical Society ; John Gordon, M.D., President, Aberdeen Branch British Medical Association ; J. R. Hamilton, M.D., Hawick, Chairman, Scottish Committee British Medical Association ; R. McKenzie Johnston, M.D., Treasurer, Royal College of Surgeons, Edinburgh ; Ashley W. Mackintosh, M.D., Professor of Medicine, Aberdeen University ; T. K. Monro, M.D., Professor of Medicine, Glasgow University ; John Playfair, M.D., President, Edinburgh Branch, British Medical Association ; J. Scott Riddell, M.V.O., Senior Surgeon, Aberdeen Royal Infirmary : Ralph Stockman, M.D., Professor of Materia Medica, Glasgow University, with, as Honorary Secretaries (for Edinburgh and East of Scotland) R. Cranston Low, M.B. ; (for Glasgow and West of Scotland) J. Walker Downie, M.B., and J. Rutherford Hill, Resident Secretary, Pharmaceutical Society.

Subscriptions should be sent direct either to the Treasurers of the three Scottish Medical Corporations or to J. Rutherford Hill, Resident Secretary, Pharmaceutical Society, Edinburgh.

Precautions against Typhoid in the German Army.

AN interesting example of the thoroughness with which all the details of the present campaign were thought out by the heads of the German army is given in *La Presse médicale* for 3rd December 1914. A member of the staff of the journal—M. Magnan—had occasion in the early summer of last year to go to Germany on an errand connected with public health. When he was passing through Rhenish Prussia, in the region of Coblenz, Mayence, Trèves, and Aix-la-Chapelle, he learned that in the beginning of the year a bad epidemic of typhoid fever had occurred there. It is of course well known that the disease is very prevalent in the Rhine basin—witness all the researches which have been carried out on “carriers” in the Strasburg laboratories. M. Magnan, however, was hardly prepared to find that every hamlet, village, and town in the country side was being minutely inspected by a Commission consisting of a magistrate, a police official, a highly-placed member of the army medical service, and a sister of mercy. The Commission had a list of all the houses in which cases of typhoid had occurred ; the fæces of the patients and contacts were being bacteriologically examined, and a complete list of bacteria carriers was being made. As soon as international affairs became strained, it was quite easy with the information obtained to remove from the district all the typhoid

carriers, so as to permit of the concentration of troops in the Rhine valley without risk of an outbreak of typhoid occurring among them.

DEGREES were conferred by Sir William Turner, Graduation Ceremony. Vice-Chancellor of the University, in the McEwan Hall, on 18th December. The following is a list of those on whom degrees and other awards were conferred:—

M.D.—† R. M. Allan; * J. R. Boyd; † G. R. Bruce; * W. M. Cairns; N. L. Lochrane; W. S. Malcolm; A. M. Masters; G. Pollock; † T. C. Ritchie; † G. H. Skinner; J. S. du Toit; R. W. L. Wallace; † G. Williams.

M.B., M.S.—G. D. Hamilton.

M.B., Ch.B.—J. H. Baird; B. Barseghian; E. G. von B. Bergh; D. G. Boddie; W. K. Chalmers; U. J. Cherry; W. A. Coats; R. P. Cormack; Georgina E. Davidson; A. M. Duarte; A. J. Ferguson; Agnes R. H. Greig; H. Jackson; C. W. Lewis; H. S. Lewis; G. A. G. Macdonald; J. Macqueen; E. S. Mellor; J. J. Molyneaux; A. C. Murray; W. H. Pallett; P. V. Ramanamurty; † J. Ritchie; R. C. Rogers; ‡ G. M. Scott; † C. G. Skinner; L. J. Spence; T. J. W. Sveinbjörnsson; P. G. Tuohy; H. M. Vickers; E. Wardman-Wilbourne; E. L. White; A. Wotherspoon.

D.T.M. AND Hy.—Chik Hing Wan.

* Highly commended for thesis.

† Commended for thesis.

‡ Second-class honours.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—The following gentlemen, having passed the requisite examinations between 5th and 8th October 1914, have been admitted Fellows (F.R.C.S.Edin.):—George Joseph Adams, M.B., Ch.B., Univ., Edin., Edinburgh; Howard Greene Barrie, M.R.C.S.(Eng.), L.R.C.P.(Lond.), Kuling, China; Francis Jarvis Browne, M.B., Ch.B., Univ., Aberd., Abertillery, Mon.; Herbert Ernest Clutterback, M.D., C.M., Trinity Univ., Toronto, Canada; Premananda Das, L.M.S.(Calcutta), L.R.C.S.(Edin.), Calcutta, India; John Flynn, L.R.C.S.E. (Triple), Ipswich, Queensland; Arthur Jonas Fredlander, M.R.C.S.(Eng.), L.R.C.P.(Lond.), Essex; Henry Edwardes Griffiths, M.R.C.S. Eng.), L.R.C.P. (Lond.), Grahamstown, South Africa; John Kirk, M.B., Ch.B., Univ. Edin., Canton, South China; Leonard Hugh McBride, M.D., Univ., New Zeal., London; Percy Peter James Stewart, M.B., Ch.B., Univ., New Zeal., Dunedin, Otago, New Zealand; William George Thompson, M.D., Univ., Edin., Sunderland; Thomas Jefferson Williams, M.D.(Iowa), L.R.C.S.(Edin.), Chicago, Illinois, U.S.A.

ON THE RELATIONS OF THE INNER SURFACE OF
THE CRANIUM TO THE CRANIAL ASPECT OF
THE BRAIN.

THE SIR JOHN STRUTHERS ANATOMICAL LECTURE DELIVERED AT
THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH ON THE
16TH DECEMBER 1914.

By J. SYMINGTON, M.D., F.R.C.S.E., F.R.S.

MR. PRESIDENT AND FELLOWS OF THE COLLEGE,—My first and most pleasant duty is to thank your Council for the honour that it conferred upon me by offering me the Sir John Struthers Lectureship. I accept the post with feelings of gratitude to my old College for such a generous recognition of my work as an anatomist. About thirty-five years ago I gave a lecture, or rather a series of lecturettes, before the President and a select group of Fellows of the College, and after this trying ordeal I was granted recognition as a Lecturer on Anatomy. Once again I am called upon to lecture in this building, and if since that time confidence in my own knowledge and ability has diminished, belief in the sympathy and indulgence of my audience has increased.

Under the terms of Sir John Struthers' Bequest this lecture must be on normal anatomy, but within this department of science the greatest latitude is allowed. Thus the lecturer may deal with any problem on human and comparative anatomy within the vertebrate kingdom, whether macroscopic or microscopic, embryological or developed. He can present a critical digest of the works of others, or submit the result of his own researches. Knowing that my hearers would consist mainly of those interested in surgery, and in the belief that Sir John Struthers founded this lectureship for the encouragement of anatomical research, I felt that an account of some original work I have recently undertaken in human topographical anatomy might prove acceptable. With the approval of the President's Council I have chosen as my subject the relations between the inner wall of the cranium and the cranial surface of the brain, an aspect of cranio-cerebral topography which appears to me to have been somewhat overlooked, although it deals with structures of great medical and surgical importance.

A study of the extensive literature on cranio-cerebral topography will show that the attention of investigators has been directed mainly to the determination of the relations of the scalp and skull to the cerebral fissures and convolutions, with the special

object of affording surgeons reliable guides to operations on the cerebral cortex. One of the earliest investigators in this department of cranio-cerebral topography was our revered and venerable teacher, Principal Sir W. Turner, who published in 1874, or forty years ago, a paper entitled "On the Relations of the Convolution of the Human Cerebrum to the Outer Surface of the Skull and Head."¹ Professor D. J. Cunningham, Turner's successor in the Chair of Anatomy in the University of Edinburgh, whose comparatively early death deprived anatomical science of one of its most brilliant representatives, wrote a classical memoir² on this subject, and enriched our museums with a very instructive series of models. Several observers have extended the study of cranio-cerebral topography to an examination of the relations of the deeper parts of the brain, such as the ventricles, basal ganglia, internal capsule and corpus callosum, to the surface. For some years past I have endeavoured, as time and suitable material were available, to improve upon the methods hitherto employed in the study of cranio-cerebral topography. In 1903³ I described a plan I had devised to illustrate the relations of the deeper parts of the brain to the surface, and recorded some of the results obtained. Again, at a meeting of the Anatomical Society, held in July 1905 in the Anatomical Department of the University of Edinburgh, I exhibited specimens showing modifications in and additions to my original methods, and prepared with the object of affording further data on this subject. Part of the results of this work was incorporated in the 11th edition of Quain's *Anatomy* (see vol. iii. pt. i., figs. 316, 317, 318, and 305).

During the course of some work on the membranes of the brain I came to the conclusion that an interesting field of research regarding their topographical anatomy had been almost entirely ignored, for although the literature of cranio-cerebral topography is very extensive, and a large number of anatomists and surgeons have published the results of their observations, no systematic attempt has been made to examine the effect of the structures intervening between the bone and the brain in producing differences, or permitting harmony in the shape of the inner surface of the skull and the outer surface of the brain. This question has acquired considerable interest within the last few years, owing to certain deductions which have been made by several eminent anthropologists as to the form of the primitive human brain, based upon an examination of the casts of the cranial cavity of prehistoric skulls.

The structures to be examined for the elucidation of this problem are the meninges of the brain, numerous blood-vessels and the cerebro-spinal fluid, and the question naturally arises as to the most convenient method of illustrating their position and relations to the skull and brain. About ten years ago I made a few casts of the cranial cavity, with the dura mater *in situ*, which I have since used regularly for teaching purposes. The few casts obtained in this way were sufficient to convince me of their value in the investigation of various points in cranio-cerebral topography, and I decided to employ this method in the researches I have now to describe.

The material used consisted of a number of entire heads which were injected with a 5 per cent. solution of formol and immersed in the fluid until the brain was thoroughly hardened *in situ*. This can be done without any appreciable contraction of the brain (see Figs. 1 and 2, with legends). The heads were then divided in a horizontal, coronal, or sagittal direction with a saw and a large flat knife. The exposed portions of the brain were carefully removed with the arachnoid and pia mater, and placed in a solution of formol. Casts were then taken of the parts of the cranial cavities thus emptied, while the dura mater was still in position. This membrane was afterwards detached from the skull and preserved in formol, and a cast taken of the bony cranial cavity, the various foramina having previously been closed with plasticine. The portions of the brain which were removed before taking the dural and bone casts were placed with their cut surfaces on sheets of glass, and moulds made of their cranial surfaces. Two moulds of each piece of the brain were taken, the first with the arachnoid and pia mater in position, and the second after the removal of these membranes and their blood-vessels. From these moulds casts were obtained. By this means we secured a series of four casts from each subject, viz.: the inner surface of the (1) cranial wall, and of the (2) dura mater: of the cranial aspect of the brain covered by the (3) arachnoid and pia mater, and (4) destitute of these membranes. To facilitate the study of the superficial relations of the brain and its membranes casts were also made of the outer aspect of the cranial wall.

The technique employed in the preparation of such casts is comparatively simple, although before it is mastered some loss of both time and specimens may occur. I was fortunate in having the valuable assistance and advice in this work of my friend Mr. J. J. Andrew, L.D.S., to whom I wish to express my warmest thanks.

The exact procedure adopted and the material used for taking the moulds or casts naturally varied according to the form and structure of the object dealt with. A plaster cast of the interior of the cranial vault can generally be shelled out by tapping the bone firmly with a hammer. If, however, the bone is sawn through too near the base the calvaria must be divided before the cast can be removed. Plaster casts of the occipital end of the skull can also be easily extracted by tapping, provided that the coronal section through the skull is not made anterior to the posterior edge of the foramen magnum. When dealing with larger and more irregular spaces, such as one half of the cranial cavity, gelatine is preferable to plaster, as the gelatine cast can be taken in one piece, whereas a plaster one cannot be extracted unless made in several blocks. From the gelatine cast a plaster mould is made from which casts can be reproduced. In my hands gelatine did not give satisfactory results for the dural casts, owing to its tendency to adhere in places to the dura mater, and I found it necessary in the lateral halves of the skull to make plaster casts in several pieces, which were subsequently joined together. The brain is easily cast with plaster of Paris, but in order to avoid injury to the brain during its removal from the mould this organ should be taken in two pieces. Gelatine is not suitable, as it is very apt to adhere to the brain, especially if any formol be left in the specimen.

In the selection of a method for any research in cranio-cerebral topography there is a great advantage in adopting one by which the various structures to be examined are preserved in as perfect a state as possible, so that should any difficulty arise in the interpretation of the photographs, reconstructions, or casts, the actual specimens from which they were obtained are still available for further examination.

By the plan I have followed in making my series of casts I have been able to keep the cranial wall, the dura mater, and the brain from which each cast was taken, but the arachnoid and pia mater had to be removed piecemeal, to expose the surface of the brain, and consequently the original specimen from which No. 3 of each series of casts was obtained had to be dissected before No. 4 could be made.

It might reasonably have been expected that series of casts such as those just mentioned would abound in our museums and anatomical and surgical departments, for their utility in the study of cranio-cerebral topography is obvious. Further, the preparation

and examination of such series constitute an essential preliminary research in order to obtain reliable data from which estimates of the cortical development of the brain of prehistoric man can be made from endocranial casts of prehistoric skulls. I have made inquiries amongst my anatomical colleagues and the curators of a number of museums, and have been unable to discover the existence of a single set of such series of casts. There are a number of plaster casts of the cranial cavity of recent man in the Hunterian Museum in London, nearly all of which were made many years ago, but the brains corresponding to these endocranial casts are not preserved. I have failed to find in any museum casts of the cranial cavity with the bone lined by the dura mater.

Professor A. Ecker,⁴ in the course of an investigation of some artificially distorted skulls of North American Indians, made endocranial casts of several dried skulls with the view of determining the alterations produced in the form of the brain. He figured (Plate III.) a cast of the interior of the skull of a child 7 to 10 years old, in whom the head had been greatly flattened over the frontal and occipital regions while over the parietals the vault was very prominent. The general outline of the cast showed the very obvious changes in the general shape of the cranial cavity which had resulted from the pressure applied to the surface of the head. The casts also exhibited markings indicating the position of certain convolutions and fissures of the cerebral hemispheres. These were especially distinct over the temporal lobe; the superior, middle, and inferior temporal convolutions and their related fissures being readily recognised. In the parietal region the cast was smooth, but Ecker thought he could recognise the position of the central fissure, and he also figures the parieto-occipital. He marked on this endocranial cast the position of the cranial sutures, and for purposes of comparison investigated the relation of these sutures to the brain in a normal adult male. Although he made endocranial casts of each half of the skull he did not attempt any comparison between these casts and the brain.

Professor G. Schwalbe⁵ prepared numerous endocranial casts for his important researches on the *juga cerebraia* and *impresiones digitatae*, but he makes no reference to the brains belonging to the skulls from which his casts were taken, although he admits that a comparison of the *juga cerebraia* in a number of skulls with the fissures of the corresponding brains is very desirable.

It has frequently been assumed that the general arrangement

of the cerebral fissures and convolutions can be determined from endocranial casts, and indeed even asserted that such casts possess the advantage of indicating the main fissures without obscuring them by secondary ones, although no systematic attempt has been made to determine the points of agreement and the differences between endocranial casts and the surface of the corresponding brains.

Casts of the cranial cavity are usually made by dividing the skull in the median plane, taking casts of each half and then joining them together. Such casts give, on the whole, the most instructive and complete illustrations of the form of the endocranial surface, but the division of the skull in the median plane and the imperfection of the cast at the union of its two halves are apt to destroy or impair certain important markings in the plane of the section, and they require to be supplemented by casts of the cranial cavity when opened by horizontal or coronal sections of the skull, as by this means we can obtain views of the exact form of the median part of the endocranial wall. I have made sets of casts of five portions of the cranial wall, viz. the vault, the frontal end, the occipital end, and the right and left lateral halves. In my collection of casts those of the vault are the most numerous, because they are easily obtained during the ordinary course of the dissection of the head and neck. After the skull-cap was sawn through horizontally for the removal of the brain, this organ and its membranes were cut across with a large flat knife at the same level as the bone. For the casts of the frontal and occipital ends of the cranial cavity coronal sections were made through the head a little in front of the bregma and some little distance anterior to the lambda. In order to make casts of the lateral halves the bone was divided in the median plane and the two halves of the skull were slightly separated, and an attempt made to cut the cranial contents just to one or other side of the falx cerebri. On each half the cerebral hemisphere was removed and a dural cast taken of the space above the level of the tentorium before the portions of the brain below this dural fold were taken out and the cavity below it cast.

Huxley⁶ asserted that it should become "an opprobrium to an ethnological collection to possess a single skull which is not bisected longitudinally." Experience has shown that the curators of our museums will not follow the advice of this great morphologist, but surely it would not detract seriously from the impressive



FIG. 1.— From a photograph of the left lateral aspect of the skull of a man aged fifty-six years, and upon this a photograph of the same aspect of the corresponding left cerebral hemisphere. The original photographs were both lifesize. In the figure they are reduced to one-half.

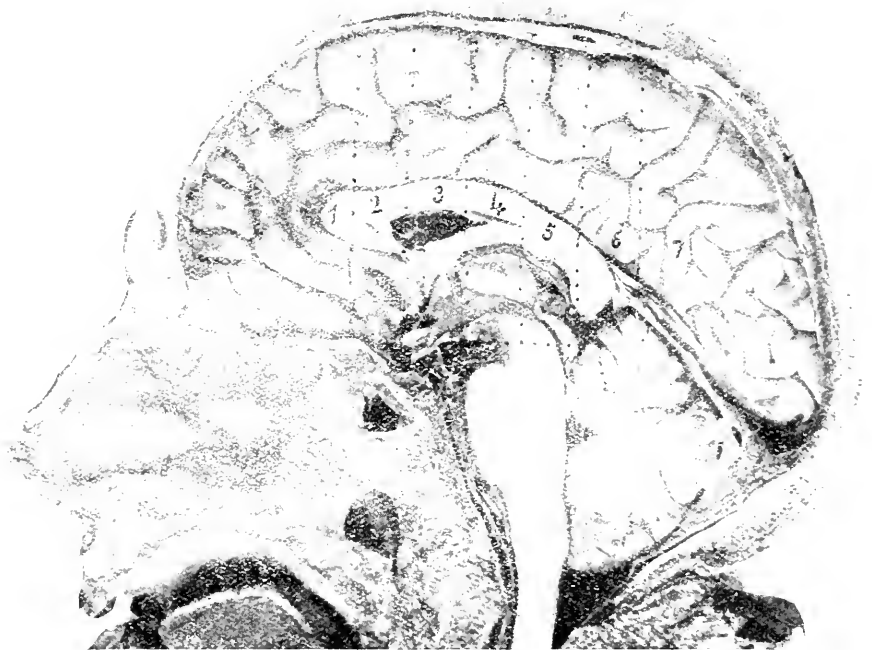


FIG. 2.— Photograph of the median aspect of the right half of a sagittal section of the head of a man aged fifty-nine years. After this section had been made the mid-brain was divided by a horizontal cut and the upper part of the brain removed from the cranial cavity and divided by six coronal sections into seven slabs. After being photographed these slabs were replaced in the cranial cavity and a photograph was taken of the median surface. The lines indicating the position of the coronal sections were just visible in the lifesize photograph, and to indicate their situation more distinctly dots have been placed at intervals along their course. This figure is one-half natural size.

The specimens represented in these two figures were used in an investigation to determine the relation of the different parts of the brain to the surface and especially of the part of the brain that begins and ends behind





FIG. 3.—Photograph of an endocranial cast of the vault of the skull, from a female aged twenty-seven years, viewed from above.



FIG. 4.—Photograph of the corresponding endodural cast.



FIG. 5.—Photograph of a cast of the corresponding part of the brain covered by the arachnoid and pia mater.



FIG. 6.—Photograph of a cast of the same brain after these membranes had been removed. G. C. A., gyrus centralis anterior; G. C. P., gyrus centralis posterior.



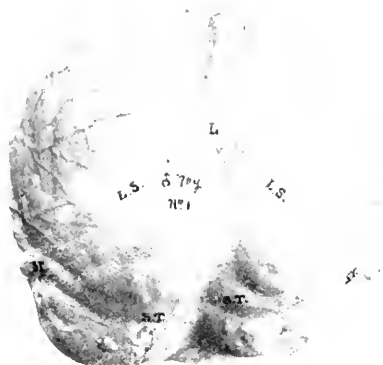


FIG. 7.—Photograph of an endocranial cast of the occipital end of the skull, from a nucleated seventy years, viewed from behind. L., lambda; L. S., lambdoidal suture; S. T., sinus transversus.

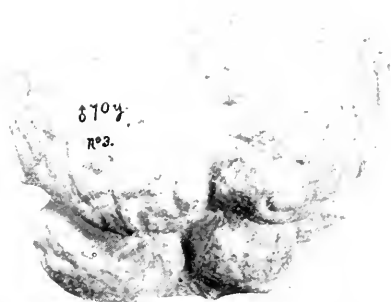


FIG. 9.—Photograph of a cast of the corresponding part of the brain covered by the arachnoid and pia mater.

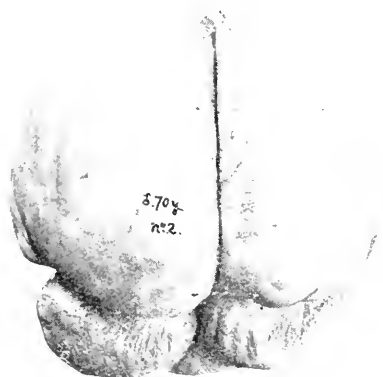


FIG. 8.—Photograph of the corresponding endocranial cast.

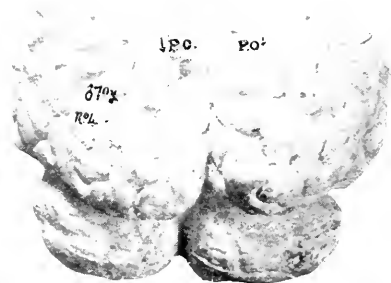


FIG. 10.—Photograph of a cast of the same brain after these membranes had been removed. P. O., paretto-occipital fissure.



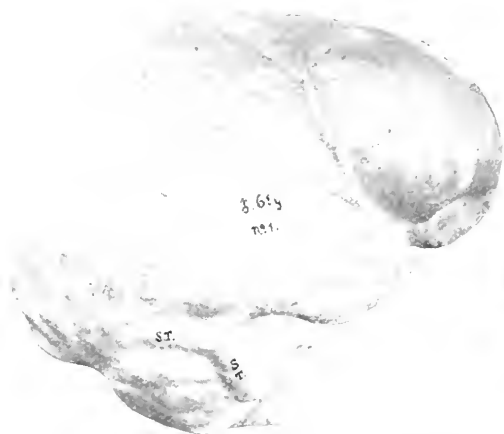


FIG. 11. - Photograph of an endocranial cast of the right half of the skull of a female aged sixty-one years, viewed from the lateral aspect. S. T., sinus transversus.



FIG. 12. Photograph of the corresponding endocranial ca



FIG. 13. Photograph of a cast of the corresponding part of the brain covered by the arachnoid and pia mater.

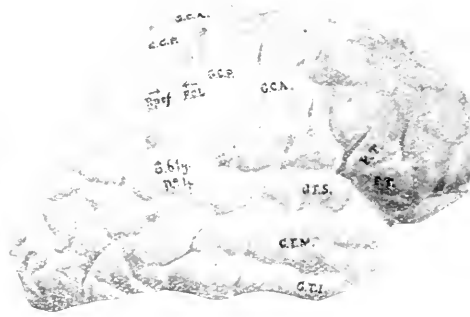


FIG. 14. - Photograph of a cast of the same brain after the membranes had been removed. G. T. S., gyrus tempo superior; G. T. M., gyrus temporalis medius; G. T. I., gyrus temporalis inferior; G. C. A., gyrus cent anterior; G. C. P., gyrus centralis posterior; R. P. C. L., posterior ramus of fissure cerebri lateralis.

(Owing to a mistake the casts from which the photographs for Figs. 11 to 14 were made were incorrectly labelled made.)



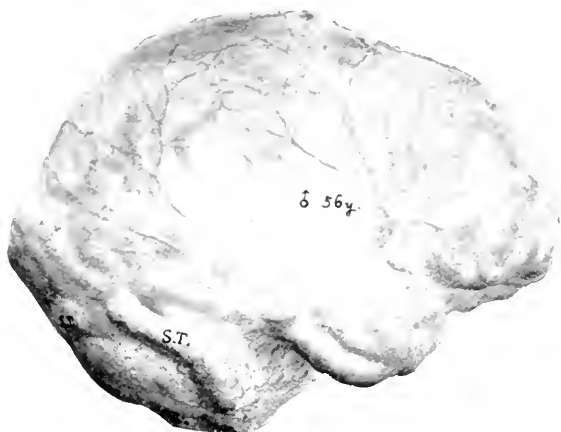


FIG. 15.—Photograph of an endocranial cast of the right half of the skull of a man aged fifty-six years, viewed from the lateral aspect. S. T., sinus transversus.



FIG. 17.—Photograph of an endoludal cast of the right half of the skull of a newly-born infant.



FIG. 16.—Photograph of the dura mater removed from the left half of the skull, viewed from the lateral aspect. The transverse venous sinus had been opened.

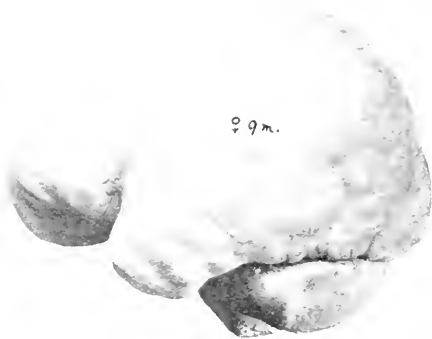


FIG. 18.—Photograph of endoludal cast of the left half of the skull of an infant nine months old.



FIG. 19.—Photograph of the dura mater of the vault of the skull, viewed from below.



FIG. 20.—Photograph of the occipital part of the dura mater, viewed from the front.

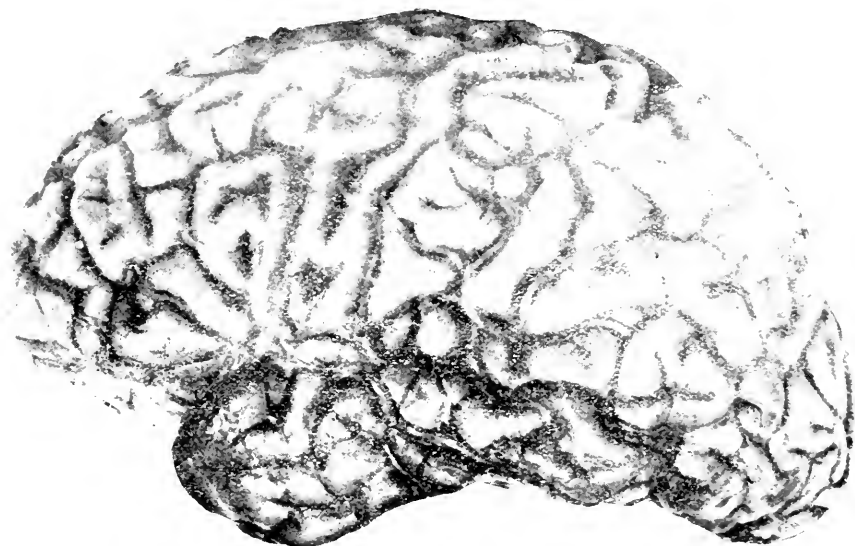


FIG. 21.—Photograph of the left hemisphere of the brain of a man aged fifty-six years, viewed from the lateral aspect. The brain was covered by the arachnoid and pia mater.



appearance of long rows of entire skulls to have at least one skull of each series exhibited in this condition, and I would venture to suggest that in addition casts should be shown of each half of the cranial cavity, for the form of this cavity is, in some respects, of more importance than the external aspect, and it is certainly advisable to be able to compare the two.

ENDOCRANIAL CASTS.—I have prepared endocranial casts of the vault of the skull from 13 adults, of 4 lateral halves, viz.: both halves of a man aged 56 years; the left half of a man aged 59, and the right half of a female aged 61; and three casts of the occipital end of the skull from a female aged 76, and two males 57 and 70, and one of the frontal end of a man 57. Photographs of some of these casts are seen in Figs. 3, 7, 11, and 15.

This collection of endocranial casts, besides demonstrating the general form of different parts of the cranial cavity, presents special markings due to the meningeal vessels, the Pacchionian bodies, the venous sinuses of the dura mater, the impressioes digitatæ and juga cerebralia.

The casts of the vault and of the occipital end of the skull resemble in general form the *norma verticalis* and the *norma occipitalis* of the skull, but a side view of a cast of one half of the cranial cavity presents some striking differences from that of the *norma lateralis* of the skull. Thus the cast shows well the shape of the anterior, middle, and posterior fossæ of the base of the skull and the sharply-defined boundaries between them. The posterior part of the lateral aspect of the anterior fossa forms a rounded projection which corresponds to a depression on the frontal bone external to its orbital plate, while a well-defined groove marks the position of the lesser wing of the sphenoid bone and separates the cavities of the anterior and middle fossæ. A deep excavation bounded posteriorly by the sigmoid part of the transverse sinus, and below and in front by the middle fossa, indicates the position occupied by the petrous part of the temporal bone.

Meningeal Vessels.—The markings showing the course of the middle meningeal vessels are too well known to require any detailed description, but I do not consider that their terminal branches afford a reliable guide to the median line of the skull, for while in some cases they appear, as described by Keith, to end in very fine twigs a little external to the median plane, in other instances they can be seen extending inwards, probably as venous grooves, to the level of the superior longitudinal sinus. Various

anatomists have directed attention to a broad deep groove passing upwards near to and almost parallel with the coronal suture. Several of my casts show a ridge corresponding to this groove, which is so deep that the cranial wall is translucent in this position.

Pachionian Bodies.—My casts show, as one would expect, considerable variations in the number, size, and position of the Pachionian bodies. In only one out of thirteen casts of the vault were distinct markings for these structures absent.

The Venous Sinuses.—The venous sinuses of the dura mater are generally described as grooving the bones, but this is by no means the case in the whole of their course. In front an endocranial cast of the vault shows a distinct median groove which may be subdivided by a slight ridge. As this groove approaches the region of the bregma it tends to become very shallow or even replaced by a convexity, while opposite about the posterior half of the sagittal suture the groove generally becomes distinct again but marked along the middle line by a narrow ridge (see Fig. 3). These markings on an endocranial cast are of interest in connection with the determination of the median line of the vault of the skull in prehistoric fragments. Thus in the reconstruction of the Piltdown skull considerable differences of opinion exist as to whether or not a large piece of the left half of the frontal and parietal portions of the vault should be so placed that certain parts of it cross the median plane on to the right side. Dr. Smith Woodward,⁷ in his original description of this fragment, stated that the sagittal suture was entirely obliterated. Since then Professor Elliot Smith⁸ has discovered a suture which he believes represents its anterior end, but no trace of the posterior part has been detected, consequently other markings have to be looked for which might serve as a guide to the relation of the posterior part of the fragment to the median line. Professor A. Keith⁹ states that "In the skull of all the higher primates the longitudinal sinus near the hinder end of the adjacent margins of the right and left parietal bones is marked by a narrow deep groove with distinct edges; on the margin of the upper angle of the Piltdown fragment the edge or margin of this groove can be clearly recognised." Hence Keith, in his reconstruction, placed the fragment so that the posterior part of its inner edge came close to, but did not cross, the median plane. I have 15 endocranial casts of this region of the skull-cap, and out of these 9 show a distinct ridge corresponding to the groove on the bone described by Keith; in most of the others it was present but only faintly marked. This

deep narrow groove is therefore not constant in man, although it appears to occur in a distinct majority of skulls.

The posterior end of the superior sagittal (longitudinal) sinus is deeply embedded in the interval between the two cerebral hemispheres, so that the latter project backwards about 2 cm. further than the sinus.

The position of the median part of the transverse or lateral sinus is indicated on an endocranial cast by a distinct depression between the prominences due to the cerebrum and cerebellum there. The sinus only faintly grooves the bone, but as it gains the lateral aspect of the skull it tends to project beyond these organs, and at the sigmoid part of the sinus produces a marked prominence on an endocranial cast (Figs. 11 and 15).

Impressiones Digitatae and Joga Cerebralia.—These are the only markings on an endocranial cast from which we can obtain any details as to the arrangement of the cerebral convolutions and fissures. My own observations on these depressions and ridges are in close agreement with those of Schwalbe,¹⁰ and I have but little to add to his excellent account of their distribution. Except in rare cases they are very feebly marked on the vault. They tend to increase in distinctness from the vault towards the base and are best developed in the anterior and middle fossæ. The cause of this distribution is somewhat doubtful, but it is probably due to gravity, the brain, having a distinctly higher specific gravity than its investing cerebro-spinal fluid, tends to sink in this fluid. Owing to the most frequent position of the head being the erect one the bony base is most markedly impressed by the brain, then as the horizontal posture is less frequently assumed, the lateral, anterior, and posterior walls are not so distinctly marked, while their absence at the vault is dependent on the accumulation of a more or less continuous layer of fluid in this situation separating the convolutions from close proximity to the bone.

Schwalbe directed attention to the fact that in many subjects the prominence formed by the free posterior border of the lesser wing of the sphenoid and lodged in the main stem of the Sylvian fissure is continued backwards and upwards on the lateral wall of the skull by an elevation which he terms *crista Sylvii ossis parietalis*. The lower border of this elevation is formed by the inferior border of the inner aspect of the parietal bone, and it usually corresponds with the anterior portion of the superior temporal sulcus. The inner surface of the squamous portion of the temporal bone almost invariably shows depressions directed obliquely

downwards and forwards, which mark the position of the middle and inferior temporal convolutions. The portion of the cranial wall above the inner line of the parieto-squamous suture is thicker than that below this suture, and it forms a prominence opposite the rather narrow and somewhat depressed superior temporal convolution. This prominence may be represented on the lateral surface of the bone by a depression directed from the region of the pterion backwards and upwards. In skulls in which the digital impressions are well marked (see Fig. 15), a series of depressions may indicate the direction of the superior temporal convolutions, and another the convolutions situated above the posterior limb of the Sylvian fissure, so that the course of this fissure, except at its posterior end, may be clearly defined on an endocranial cast. In other cases the digital impressions bounding the posterior limb of the Sylvian fissure may be quite indistinct (see Fig. 11). On the lower portion of the outer aspect of the inferior frontal convolution there is a rounded prominence which lies in a distinct fossa on the temporal part of the squamous portion of the frontal bone. This fossa is represented on the lateral aspect of the cranial wall by the protuberantia gyri frontalis inferior of Schwalbe, which, with those opposite the middle and inferior temporal convolutions, are of special interest as being elevations of the outer aspect of the cranial wall corresponding to convolutionary prominences of the brain. Although these cranial "bumps" are covered by the temporal muscle they can often be felt in the living body. The convexity on an endocranial cast corresponding to the fossa for the lodgment of the elevation on the inferior frontal convolution is usually smooth, but may be marked by one or more grooves due to cerebral sulci. The digital impressions and cerebral ridges on the orbital plates of the frontal bone are never absent, and, as a rule, clearly map out the convolutions and fissures on the orbital aspect of the frontal lobe of the brain. The elevations on an endocranial cast opposite the frontal and parietal eminences on the skull-cap are usually rather more distinct than the latter, owing to a slight thinning of the frontal and parietal bones in these places, and a similar condition obtains at the cerebral fossæ of the squamous part of the occipital bone.

Viewed from the lateral aspect an endocranial cast shows a very distinct hollow in front of the sigmoid part of the transverse sinus, which is due to the elevation of the petrous part of the temporal bone as compared with the floor of the middle fossa of the base of the skull in front of it.

ENDODURAL CASTS (see Figs, 4, 8, 12, 17, and 18).—The dura mater, although generally regarded as one of the membranes of the brain, may from a morphological and surgical point of view be considered a part of the cranial wall, since it forms the internal periosteum for the cranial bones. Its blood-vessels, very inappropriately termed meningeal, are mainly distributed to these bones, and are completely separated by the subdural space and the arachnoid from the vessels that supply the brain. As the meningeal vessels ramify over the outer aspect of the dura mater and this membrane contains a number of venous sinuses and forms various folds which project towards the cranial cavity, it is evident that casts of the cranial wall with and without dura must differ from one another in various respects. The branched elevations due to the meningeal vessels, which constitute such a characteristic feature of an endocranial cast, are entirely absent on an endodural one, the cranial surface of the dura mater opposite these vessels being smooth. It is true that over a large part of the endocranial surface the dura mater is thin and closely applied to the bone, so that the digital impressions on the bone are duplicated in relief on both the endocranial and endodural casts, but in the position of the superior sagittal and transverse sinuses and their immediate neighbourhood there is no such harmony.

As the superior sagittal sinus projects downwards between the two cerebral hemispheres and gives attachment to the falx cerebri, and as the horizontal portion of the two transverse sinuses is lodged in the groove between the cerebrum and the cerebellum and is continuous with the tentorium cerebelli, their effect on the form of endodural casts (Figs. 4, 8, and 12) as compared with those of the bone itself (Figs. 3, 7 and 11) needs only to be mentioned to be appreciated. The sigmoid part of each transverse sinus, on the other hand, grooves deeply the bone and does not project internally, so that its position is only faintly indicated on a cast of the inner surface of the dura mater.

The relations of the dura mater and the appearances of its cerebral surface in the immediate neighbourhood of the superior sagittal and the transverse sinuses require a more detailed consideration, as they have been either entirely ignored or imperfectly described in our anatomical and surgical text-books. When the vault of the skull with its contents is removed by a horizontal section, and an attempt is made to take out the upper part of the cerebral hemispheres along with the arachnoid and pia mater, the

subdural space is found to be interrupted near the median plane by the passage of the arachnoid and a number of subarachnoid blood-vessels into the dura mater. If these structures be torn and the brain removed, the cerebral surface of the dura mater is seen to be broken up into a number of fasciculi the clefts between which serve for the passage of the structures already mentioned as crossing the subdural space. The superior cerebral veins pass into the venous channels known as the lacunæ laterales, or sometimes directly into the sagittal sinus, while the small arteries of the pia, pushing the arachnoid before them, project into the venous spaces and form the capillary tufts of the Pacchionian bodies.

Mr. P. Sargent¹¹ has recently directed attention to the surgical importance of the lateral lacunæ, as they may render the upper end of the cortical motor area relatively inaccessible to the surgeon. In one case he found that each parietal lateral lacunæ measured 15 cm. in length and 2.5 cm. in breadth at its widest part.

Fig. 19 is a photograph of the dura mater of the vault viewed from the cerebral aspect in a man aged 60 years. The dura mater was suspended by threads in front of a good light. At the sides it is seen to be smooth and translucent, while near the longitudinal sinus it is rough and opaque, owing to irregular projections of the dura mater and the presence in its substance of venous lacunæ and Pacchionian bodies. In this specimen the lacunæ form a more or less continuous series from about half-way between the nasion anteriorly backwards on the frontal and parietal bones as far as the level of the parietal foramina. They are broadest towards the anterior part of the interparietal suture, where the two lateral lacunæ and the sagittal sinus have a breadth of about 3.5 cm. The corresponding subdural cast presents a number of broad grooves running mainly inwards and forwards which lodged the superior cerebral veins, and numerous fine transverse or oblique depressions which were occupied by fasciculi of the dura mater.

Fig. 20 is a photograph, taken from the front, of the inner surface of the dura mater in the occipital part of the skull. The tent-like tentorium is seen to divide the cranial cavity into an upper and a lower portion for the lodgment respectively of the cerebral hemispheres and the cerebellum. Below the posterior attachment of the tentorium on each side of the falx cerebelli the dura mater presents a distinctly rough fasciculated area. The clefts between

these fasciculi serve for the passage into the dura mater of the arachnoid and pia mater covering the opposed portion of the lateral lobes of the cerebellum. This peculiar appearance of the dura mater has been generally overlooked, although it was figured many years ago by Kay and Retzius.¹² The grooves in an endodural cast due to these fasciculi are seen in Fig. 8.

This coronal section of the skull divided the base just in front of the posterior edge of the foramen magnum, and it will be seen that the median fold of the dura mater forming the falx cerebelli terminates some distance behind the foramen magnum. Between the foramen and the falx the dura covers a flat triangular area which was termed by Schwalbe the trigonum vermicianum, although it must be remembered that it is not in contact with the vermiform process of the cerebellum, being separated from it by the cerebro-spinal fluid contained in the cisterna magna.

ARACHNOID CASTS. — There are no large cisterna for the cerebro-spinal fluid over the cranial aspect of the convoluted surface of the cerebral hemispheres, still there is sufficient fluid with the arachnoid, the pia mater, and the cerebral vessels covering the cerebral cortex to obscure the course of many of the cerebral fissures. The larger amount of the cerebro-spinal fluid at the vault as compared with the base is mainly responsible for the imprint of the convolutions at the base in the form of digital impressions and their practical absence at the vault. These facts are readily demonstrated by an examination of the series of casts in which the form of the bone, the dura mater, the arachnoid and the brain itself are represented.

The appearance of the arachnoidal surface is seen in Fig. 21, made from a photograph of the left cerebral hemisphere of a man 59 years old, viewed from the lateral aspect. This photograph shows that the arachnoid is reflected at the vault from one convolution to another without any marked depression opposite the fissures, while at the base and in the region of the frontal and occipital poles it makes a distinct dip inwards and the fissures are consequently more sharply defined. In the neighbourhood of the Sylvian point, however, it bridges across the fissure to form a small cisterna.

As a rule the cranial surface of the lateral lobes of the cerebellum is moulded pretty closely to the bone so that the position of the great horizontal sulcus can usually be detected in an endocranial cast of the cerebellar fossa of the occipital bone, but opposite the pyramid of the inferior vermiform process and the

adjacent portion of the lateral lobes, the large collection of cerebro-spinal fluid which is contained in the cisterna magna causes a distinct separation between the cerebellum and the bone.

BRAIN CASTS.—When the cranial aspect of the cerebral convolutions of a well-hardened brain is examined both before and after the removal of the arachnoid and pia mater it will be found that the larger cerebral vessels by no means invariably occupy the sulci, but frequently lie superficial to and groove the convolutions. Further, the convolutions do not present a uniform flat surface, but exhibit elevated and depressed portions, the latter being generally bridged over by the arachnoid, beneath which are small pools of cerebro-spinal fluid. It must also be remembered that in order to identify fissures with certainty it may be necessary to open them up to ascertain their relations to the “concealed” convoluted surface of the hemisphere. This is especially the case with the branches of the Sylvian fissure and the associated insular opercula, as the latter are bounded by fissures which extend into the limiting sulcus of the island of Reil. It is evident from these facts and from the relations of the arachnoid and dura mater already described, that great caution must be exercised in attempting to determine the fissural and convolutionary pattern of the brain from an endocranial cast. If all the membranes of the brain were uniformly thin, the cerebro-spinal fluid very small in amount, and there were no cisterns in which this fluid could accumulate, an endocranial cast would give a fair pattern of the superficial convolutions and the fissures bounding them, but we know that such conditions are non-existent, except over limited areas. It has been supposed that an estimate of the degree of simplicity or complexity of the convolutions and fissures could be formed from the number and arrangement of the *impressionses digitatæ* and *juga cerebralialia*, but unfortunately for this hypothesis few and feebly marked digital impressions may exist with a well-convoluted brain. If the endocranial cast of the lateral half of the skull of a man 56 years of age (see Fig. 15) be compared with that of a female 61 years of age (Fig. 11), it will be found that the imprints of the digital impressions differ very markedly, yet in these two subjects there was no essential difference in the complexity of the convolutionary pattern.

The only cerebral fissures which can, as a rule, be identified on an endocranial cast are the main stems of the Sylvian fissure and its posterior branch, the superior and middle temporal sulci and

those on the orbital surface of the frontal bone. Those fissures which cut into the superior border of the cerebral hemisphere, such as the central and parieto-occipital, are not indicated on an endocranial cast owing to their being separated from the bone by some of the following structures, viz.: the superior sagittal sinus and the lacunae laterales embedded in the dura mater, the superior cerebral veins, the arachnoid and cerebro-spinal fluid, and the Pacchionian bodies. The course of these fissures outwards on the superior aspect of the hemisphere cannot be followed, mainly owing to the accumulation of the cerebro-spinal fluid on the vault.

In skulls in which the digital impressions and intervening ridges are well marked, an endocranial cast shows, of course, corresponding markings, but except at the base the ridges, even when superficial to cerebral fissures, are interrupted too frequently to permit of the latter being mapped out except in a vague and uncertain manner. We have already referred to the elevation on the lateral aspect of the frontal lobe occupying a depression on the part of the frontal bone which enters into the formation of the floor of the temporal fossa. In this region of the brain is placed the inferior frontal convolution, and it is marked by a number of fissures (see Fig. 14). The anterior branch of the Sylvian fissure cuts into it and divides into two sulci (anterior ascending and anterior horizontal) bounding the cap of Broca, pars triangularis, or frontal operculum (PT, PT, on Fig. 14). The frontal operculum is related medially to the orbital operculum and behind to the fronto-parietal operculum. In addition to the two anterior branches of the Sylvian fissure other sulci, such as the diagonal and branches of the inferior frontal and inferior precentral, may be found in this region. On none of my four endocranial casts of the lateral half of the skull can these fissures be identified, and in two of them the whole area forms a nearly smooth rounded elevation.

From the endocranial casts of La Chapelle,¹³ La Quina,¹⁴ and Piltown¹⁵ paleolithic skulls, Professors Boule, Anthony, and Elliot Smith have described the arrangement of a number of the cerebral fissures and convolutions, and upon this basis have constructed theories regarding the evolution of the brain of ancient man.

It is only from the size and form of the cranial cavity that we can form any opinion as to the degree of cerebral development of the prehistoric races of mankind since their brains have not been

preserved. So far as I am able to judge, the endocranial casts of the prehistoric skulls which have been found up to the present do not yield any more information regarding the convolutionary pattern of the cerebral cortex than those of existing man. It is unfortunate that the facts they reveal are so few in number and so lacking in precision, but it is surely better to admit frankly the limitations of our knowledge than to reconstruct primitive brains upon such slender data.

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ON THE VALUE OF EMULSIONS OF LIQUID PARAFFIN AND CASTOR-OIL IN THE TREATMENT OF CERTAIN TYPES OF CHRONIC DYSPEPSIA IN CHILDHOOD.

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THIS paper deals with the treatment of various forms of chronic dyspepsia in children over one year by emulsions of liquid paraffin or of castor-oil. It is based on the notes of about 120 cases which I have observed in the Out-patient Department of the Children's Hospital during the last three years. For the

sake of clearness and brevity the conclusions will be first stated, and then short case records will be given in support of these conclusions.

Conclusions.—1. Emulsions of liquid paraffin or of castor-oil (in small non-purgative doses) are of great value in the treatment of various and apparently distinct types of chronic dyspepsia in childhood.

2. The types dealt with are:—

(a) Malnutrition, frequently associated with chronic diarrhœa, and only seldom with constipation.

(b) Enuresis, with dyspeptic symptoms.

(c) Recurrent vomiting (cyclical or bilious vomiting).

(d) Recurrent attacks of fainting, or sudden pallor.

(e) Urticaria or eczema, with dyspeptic symptoms.

3. In a great majority of these diverse types of illness there is an abnormal condition of the stools: this may often be a true diarrhœa, but not seldom also merely a too soft consistence of the stool with or without the presence of mucus. In the series constipation was present in only a small majority.

4. A large number of these cases have followed the common infectious fevers of childhood, especially measles and whooping-cough. These post-infection cases of dyspepsia seem to me particularly amenable to this form of treatment.

5. In a series of 13 completed cases of enuresis, 8 were cured and 3 greatly benefited by this treatment.

6. The action of liquid paraffin and castor-oil used as described is similar. It is entirely local, and confined to the mucous membranes of the alimentary tract. The action is most probably a sedative one, exerted on the congested and unhealthy mucous lining of the small and large intestines.

Preliminary Remarks.—Before detailing cases under the different groups given, a few general remarks may be made.

Children suffering from dyspepsia in one or other of its many clinical types form an easy majority of the cases attending an out-patient department. They show many symptoms of disturbed health. Some of these symptoms stand out large in the foreground of the clinical picture; others are less conspicuous and in the background. But these leading symptoms frequently exchange their positions, some being prominent in one child, but subordinate in another. Among those that are seldom absent are slowness of

growth and thinness; a morbid appetite—either refusal of food (anorexia) or greediness (bulimia); disturbed sleep—in many degrees; muscular asthenia—shown in tiredness, refusal to play; vaso-motor depression—shown in the coldness of hands and feet and in unusual susceptibility to cold, and no doubt also in the cases of fainting attacks described in a special group; instability of the nervous system—shown in timidity, shyness, and irritability. There are also frequently reports of cough, with or without enlarged tonsils and adenoids; also of the presence of worms, which it is often difficult to describe as a cause, or merely an effect and complication of the general dyspepsia. Another symptom often present, though seldom mentioned in text-books, is thirst. In 74 cases of this series its presence or absence was investigated; it was present in 55 (74 per cent.), and absent in 19 (26 per cent.).

It will be convenient to introduce here evidence in support of Conclusion 3 that in a majority of cases of chronic dyspepsia of all kinds in childhood there is what may be vaguely but sufficiently described as “looseness of the bowels.” In the present series cases of constipation were a small minority. The results in 109 cases were as follows:—Bowels loose, 61; bowels regular, 27; constipated, 21.

The group “regular” included cases where the motion was abnormally loose in consistence, or contained mucus, or was unusually foul in odour.

Conclusion 4 states that chronic dyspepsia is a frequent sequel of the infectious fevers. In the present series this fact of history was ascertained in one-third of the cases (40 out of 120). In all but two of these it was whooping-cough or measles. This frequency is almost certainly an under-statement. The absence of record in the hurried notes of out-patient cases may often indicate, not the absence of the fact, but simply the omission to look for it. But it is striking how often the mother of the child will volunteer such a statement as that “He had the measles a year ago, and he has never been the same since.”

Castor-oil in small doses is a remedy well known and long established in the treatment of chronic diarrhoea in children. Various petroleum emulsions (liquid paraffin) are and have long been advertised by firms of chemists as valuable for wasting conditions, bronchitis, etc.; they are nearly always combined with hypophosphites. But I do not know that liquid paraffin is recommended for specific conditions of dyspepsia in the important

text-books of children's diseases. We all know that of late years it has been and still is largely used in the treatment of constipation in adults. The cases to be cited presently do not, however, show constipation except in a very few instances; the majority of them show the contrary condition of diarrhœa. The object of this paper is to show that the use of castor-oil as described may be extended to other conditions; and that the use of liquid paraffin may be made more definite and is suitable in the same groups of conditions as castor-oil—in short, it is to give specific indications for the use of these inert oily substances (inert as regards laxative action) in certain chronic disorders of childhood associated with dyspepsia.

In the notes of cases the following abbreviations, refer to the corresponding formulæ:—

Emuls. paraff. liq. = R Paraff. liq. ʒiij.; Gum. acac. ʒiij.; Gum. tragacanth. gr. xij.; Ol. cass. ʒviiij.; Aq. destill. ad ʒvj. Sig. ʒi. t.i.d. p.c.

Emuls. ol. ric. = R Ol. ric. ʒijs.; Gum. acac. ʒvj.; Aq. aurant. ʒv.; Aq. cinnam. ad ʒvj. Sig. ʒj. t.i.d. p.c.

Pulv. hydr. et sol. sal. = R Hydrarg. subchlor. gr. i.; Sod. sal. gr. ij.; Sod. bicarb. gr. v. Sig. One powder given every night.

Pulv. hydr. et rhei. = R Hydrarg. subchlor. gr. i.; Pulv. rhei. gr. i.; Magn. carb. gr. iij. Sig. One powder to be given nightly.

Thus in the above formulæ liquid paraffin is given in thirty minim doses thrice daily, and castor-oil in fifteen minim doses thrice daily. I have often found the above powders to be useful adjuvants. But given alone, they failed to yield the good results obtained in combination with paraffin and castor-oil, and in many cases the latter given alone have produced completely satisfactory results. By these experimental variations I have tried to satisfy myself that the principal factor in the cure or improvement recorded has been the liquid paraffin or the castor-oil.

GROUP (a).—MALNUTRITION, WITH CHRONIC DIARRHŒA.

CASE I.—Eleanor R., æt. 1½ year. Healthy until 4 months ago, when diarrhœa began and has continued since; 4 to 5 loose motions daily. Progressive wasting; appetite fair; vomiting very seldom. Occasional urticarial eruptions.

Treatment and Result.—*Emuls. paraff. liq.*, and dieting. Steady progressive improvement under continuous treatment. Four months later, noted marked improvement in appetite, colour, and general condition, and gain of 7 lb. in weight (15 lb. 4 oz. to 22 lb. 8 oz.). Bowels moving once daily.

CASE II.—Jane S., *æt.* 3½. Has “gone off her meat” and been very nervous since measles 8 months ago. Is thirsty, easily tired; motions loose, frequent, and contain mucus.

Treatment and Result.—P. Hydr. et sod. sal. and Emuls. paraff. liq. Improvement quickly manifest, and 2 months later the motions regular and healthy, with marked improvement in appetite and general health.

CASE III.—Emily W., *æt.* 8 years. “Never well” since pneumonia and whooping-cough a year ago, with anorexia and malnutrition. Bowels regular, with occasional constipation.

Treatment and Result.—Emuls. paraff. liq. *A week later*, noted great all-round improvement. Bowels regular; sleep now tranquil (formerly disturbed); “an awfu’ difference” in her appetite. Did not return for further observation.

CASE IV.—Mary W., *æt.* 1½ year. Chronic diarrhœa for 6 weeks; motions 6 to 12 daily, sometimes containing blood. No previous infectious diseases.

Treatment and Result.—P. Hydr. et rhei.; Emuls. paraff. liq. After 4 weeks, motions 1 or 2 daily, never more than 3.

CASE V.—Catherine D., *æt.* 3 years. Getting thin, and in poor condition since scarlet fever 7 months ago. Diarrhœa (4 to 5 motions daily, with mucus) since measles 6 weeks ago.

Treatment and Result.—P. Hydr. et sod. sal.; Emuls. paraff. liq. After a fortnight, motions 2 to 3 daily, and definite improvement in appetite, vigour, and condition. Did not return for further treatment.

Remarks.—All the above cases were treated with liquid paraffin. I have not quoted cases of treatment by castor-oil because its value in this type of disorder is established. Three of the cases (II., III., and V.) were sequels of infectious disease. I could quote a number of similar cases of this kind which indeed seem specially amenable to this treatment.

Two of the cases (III. and V.) were only under observation for a short period. It may not seem right to use them as evidence of the value of the treatment, but I have cited them, because in their short time of observation definite improvement was already manifest. They may very well have relapsed later, but so long as they continued under the treatment their condition showed distinct amelioration.

This is the group of conditions described vaguely as “wasting” or “malnutrition” in the advertisement of proprietary petroleum emulsions. They are cases of wasting, dependent upon a catarrhal

condition of the large bowel and possibly also of the small bowel. The sedative and restorative action of liquid paraffin (and castor-oil) upon the unhealthy mucous membranes is followed by rapid improvement in the condition of malnutrition. The addition of hypophosphites to emulsions of liquid paraffin seems unnecessary; equally good results are obtained without them.

I wish by no means to claim that this treatment is an infallible and certain one—I have notes of cases in which both liquid paraffin and castor-oil failed completely—but it deserves a high place among remedies for this type of disorder. In the majority of my cases it produced a general amelioration which was not only definite, but rapid. And it was specially effective in those cases that follow the common infectious fevers of childhood.

This group also included cases of lenteric diarrhoea, with or without abdominal pain, and in them the results of treatment by liquid paraffin or castor-oil were very good.

GROUP (b).—ENURESIS.

CASE I.—Thomas G., *æt.* 10½ years. A tall, thin boy of dejected appearance, languid and lazy in his movements. Nocturnal enuresis since *æt.* 2 years, not every night, but very frequently. *Intermittent attacks of diarrhoea.*

Treatment and Result.—P. Hydr. et sod. sal.; Emuls. paraff. liq. This continued for 4 months. From the outset, enuresis entirely ceased. During the following 4 months treatment stopped, with complete absence of enuresis. Great improvement in general health, and a gain of 5 lb. 10 oz. Enuresis then reappeared, when treatment resumed. Has not reported himself since.

CASE II.—Jessie B., *æt.* 9. Occasional nocturnal enuresis since measles, *æt.* 3 years; every night for last 3 weeks. *Bowels regular, with occasional attacks of diarrhoea.* Good appetite; very fond of sweets. Is thin, but complexion is of good colour.

Treatment and Result.—P. Hydr. et sod. sal. and Emuls. paraff. liq. for 1 week, without improvement. Then Emuls. ol. ric. alone. Immediate improvement followed. During this treatment for 7 weeks enuresis only occurred four times and at long intervals. She then disappeared from observation.

CASE III.—Mary D., *æt.* 8 years. Marked dyspeptic symptoms and malnutrition since whooping-cough and measles, *æt.* 3 years. Enuresis almost nightly, and also daily, for about 3 years. Passed thread-worms a year ago. *Bowels constipated.*

Treatment and Result.—P. Hydr. et sod. sal.; Emuls. paraff. liq.

Little improvement for about 3 months, when the addition of a little cascara to the emulsion relieved the constipation. Enuresis then rapidly improved, and after 2 months of further treatment by the original emuls. paraff. liq. had entirely disappeared. She remained cured during 6 weeks of further observation and without treatment.

CASE IV.—Marion S., æt. 1 $\frac{9}{12}$. Suffers from worms, is very cross, and has a greedy appetite. *Bowels regular, but at times loose, and containing mucus.* Frequent enuresis.

Treatment and Result.—P. Hydr. et sod. sal.; Emuls. paraff. liq. During 4 weeks of treatment enuresis did not occur; the bowels became regular and healthy, the worms disappeared, appetite was no longer voracious, and her general condition was described as "very much better."

Remarks.—I have notes of 25 cases of enuresis treated, or still under treatment, by liquid paraffin or castor-oil. Signs of dyspepsia were present in every one. The condition of the bowels was noted in 23, and the stools were loose in 10, regular in 10, and constipated in 3. The onset of the condition followed measles or whooping-cough in 9 cases.

I shall give a tabular statement of the results. It must be understood that the word *cure* need not mean *permanent cure*. It only means that enuresis was completely stopped by the treatment, and continued so after treatment was withdrawn and as long as the child remained under observation.

Results.—Number of observed cases, 20.

Cure	8 cases
Great improvement	3 „
Slight improvement	1 case
No improvement	1 „
Still under treatment and improving	3 cases
Still under treatment, no improvement as yet	4 „

Five cases did not return after the first examination and prescription.

It will be noted that of the four cases cited, the cure was effected by liquid paraffin in three, and by castor-oil in the fourth. After careful observation I am still in doubt as to which of these drugs is superior, and I cannot at all from the clinical symptoms of the cases discriminate a special type which indicates the one or the other. In the meantime I am inclined to believe that castor-oil in these doses is the more powerful sedative, and the more effective remedy.

In three cases of the series belladonna or atropine was first

employed, and without effect; in two of these, liquid paraffin and castor-oil were then used, and with success; in the third, both were used and failed.

I would claim, therefore, that this treatment deserves a place among the remedies for enuresis; and I am not aware that it has been hitherto used for this purpose. It may be repeated that these 25 consecutive cases of enuresis all showed signs of dyspepsia, and that the benefit was seen in the improved general health and digestion of the child as well as in the improvement of the enuresis. This would seem to indicate that in these cases of dyspepsia with enuresis the loss of bladder-control has been set up and is maintained by the unhealthy condition of the bowel.

GROUP (c).—RECURRENT VOMITING.

CASE I.—Adam R., *æt.* 4 years. Attacks of vomiting with fever and prostration every week for three months. Appetite poor; very thirsty. Bowels regular, of foul odour, and sometimes a little constipated. Sleep restless.

Treatment and Result.—P. Hydr. et sod. sal.: Emuls. paraff. liq. with extract of malt. This continued for 3 months with slight alterations, during which no vomiting took place, and headache was complained of thrice. Appetite was still not satisfactory, and there were occasional abdominal pains. The pure emulsion of liquid paraffin was then given, and continued for 2½ months, during which his appetite and general health became excellent. Treatment was then stopped, but the boy was kept under observation for three months further, and during that time remained perfectly well.

CASE II.—Martin C., *æt.* 11 years. Recurrent attacks of vomiting and diarrhoea for 3 years; lately these have become much more frequent ("almost daily"). *Said to have been liable to diarrhoea since infancy.* Poor appetite. Thin, but of high-coloured complexion. Has enlarged tonsils and adenoids.

Treatment and Result.—Emuls. paraff. liq. After two weeks his appetite was better, and he had had only one attack of vomiting. He then disappeared, but returned in a month, when he reported no vomiting but an attack of diarrhoea for the preceding four days. He did not report himself further.

Remarks.—I could quote other cases of this kind, in some of which this treatment succeeded, while in others it failed. It would seem that in some at least of these curious recurrent explosions of vomiting the fundamental condition is a con-

tinuously present latent dyspepsia, and that this yields to the sedative action of the paraffin, as shown in the above cases.

GROUP (d).—RECURRENT ATTACKS OF FAINTING, OR
SUDDEN PALLOR.

CASE I.—Lily M'L., æt. 11 years. Eight months ago had severe diarrhœa, with blood in motions. Since that, has had from time to time fainting attacks (turns very white and feels faint). Appetite greedy. *Motion twice daily, and generally loose.* Sleep restless.

Treatment and Result.—P. Hydr. et rhei. and Emuls. paraff. liq. After a month, bismuth salicylate substituted for above powder, but liquid paraffin continued for three months in all. Treatment then stopped, but child kept under observation for three months more. No fainting attacks during the entire period, and definite improvement in nutrition and general health.

CASE II.—Hetty A., æt. 7 years. For some time has been taking peculiar "turns"—suddenly getting a nasty yellow colour and thereafter feeling weak and "done." She always keeps thin. Appetite very poor. Bowels sometimes constipated. Occasional abdominal pain.

Treatment and Result.—P. Hydr. et sod. sal. and Emuls. paraff. liq. Under treatment and observation nearly three months, with immediate cessation of fainting attacks, and steady improvement in appetite and nutrition. The abdominal pains ceased after a few weeks.

Remarks.—This occurrence of partial cardiac syncope is not uncommon in chronic dyspepsia; it seems to be produced by vaso-motor instability.

GROUP (e).—URTICARIA AND ECZEMA.

CASE I.—Molly M'N., æt. 5 years. Complaint of itching spots on the trunk and limbs for some time. Appetite small and capricious. Bowels occasionally constipated. Craves for sweet things, and "eats sweet condensed milk in spoonfuls." On examination, she showed a typical urticarial eruption.

Treatment and Result.—P. Hydr. et sod. sal. and Emuls. ol. ric. During treatment, which lasted 6 weeks, no fresh eruption took place; the appetite improved very much, and the bowels became regular.

CASE II.—Arch. T., æt. 9 years. Shows a dry scaly and red

eczema of the arms, neck, and thighs. Appetite capricious; is fond of eating raw turnips and raw oatmeal, and eats much sugar; is very thirsty. Sleep restless. Bowels sometimes constipated, sometimes loose.

Treatment and Result.—P. Hydr. et rhei. and Emuls. paraff. liq. An ichthyol ointment was applied to the skin. Returned after 2 weeks, when the skin was much better; he then disappeared.

Remarks.—Of late years cases of urticaria in children have been regarded as illustrations of food-anaphylaxis; that is to say, a condition of food-intoxication produced by the absorption from the bowel and the circulation in the blood of undigested protein. Some breach has occurred in the intestinal mucous membrane through which unaltered albumen has passed into the blood-vessels. Urticaria is a very common occasional incident in the course of acute and chronic dyspepia, especially in infants and younger children. It seems reasonable that these oleaginous preparations should be valuable in repairing the breaches in the intestinal mucous covering, and in a fair number of cases I have found this treatment successful, whatever is the correct explanation of its action.

The position of eczema in children among the anaphylactic phenomena is more disputed. I have quoted Case II., not as evidence of the value of paraffin in this particular case (the period of observation was too short), but to draw attention to the association it shows of a morbid craving for raw, irritating food together with eczema. It is not infrequent to find a dyspeptic history in the history of cases of eczema. As to the results of treatment of cases of eczema by paraffin and castor-oil, after observation of a fair number of cases, especially in babies and younger children, I must confess them to be disappointing. But careful observation of the state of the digestion in eczematous children leads me to support those who say that the condition is generally an anaphylactic one.

General Concluding Remarks.—A few detached remarks may be made in concluding this paper.

Scepticism is naturally aroused by the indiscriminate use of a remedy in a variety of conditions and by a claim to its efficacy in all. But I have tried to show that these apparently separate disorders seem generally to have clinical features in common (let them be called the general symptoms of chronic dyspepsia). These common clinical features probably depend

upon some unhealthy condition of the intestinal mucous membrane, and this condition is probably the root and source from which the other special manifestations of the disorder spring. The action of liquid paraffin and castor-oil in these doses is certainly an entirely local one on the inner lining of the digestive tract; their influence is probably to soothe the congestion and catarrh of these surfaces, to diminish the congestion of the blood-vessels, and to restore a healthy activity of the digestive glands. I have tried the other well-known medicinal remedies for chronic dyspepsia, both alone and in conjunction with these emulsions—alkalics, bitter infusions, astringents (bismuth salts, dilute mineral acids), intestinal antiseptics (salol, beta-naphthol)—and I have been persuaded that *in most cases* the treatment by liquid paraffin or castor-oil is superior to every one of these. It is least successful where there is constipation; its superiority is most marked where there is chronic diarrhœa, or a looseness of the motions with or without undue frequency. It might almost be described as the sovereign remedy for the serious condition of anorexia and malnutrition that so often follows an attack of measles or whooping-cough among poor children. The restoration of appetite, vigour, and good temper from a condition of listlessness and general misery is not only quite definite, but is also already apparent in a few days, and one feels bound to ascribe the happy result to the drug (see Group (a), Case III.). But I would make no claim that this treatment is a panacea for all forms of chronic dyspepsia. Yet after a trial of it in a large number of cases, extending over nearly three years, I would say that *among drugs* it deserves the first place.

Dict.—Little or nothing has been said about diet in this paper. This is not because the feeding is an unimportant matter in the management of those cases. It is of great importance. But in out-patients of the poorer classes it is easy to advise as to the food, but difficult to control it. The general recommendations given as to diet have been as follows:—To stop altogether, if possible, sweets, raw fruits, sweet cakes, jam; to restrict very much soups and the red meats; to be sparing with eggs, porridge, and green vegetables at the outset; to allow freely, milk, fish, and white meats, bread and butter, the finer cereal puddings, orange juice and a little cooked fruit, and the malt preparations and foods. But in so many cases these instructions were not carried out that it was clear that the success or failure of the result had

nothing to do with the revision of the diet. So also with regard to general hygiene; this was beyond control. It may therefore be claimed that where a good result was obtained it was often in spite of improper food and bad hygienic conditions; the drug was the potent effectual agent in the restoration of health.

The sub-groups of chronic dyspepsia given are not sharply divided; and cases occur in which one child might be placed in two or more of them, suffering at the same time, for example, from chronic diarrhœa, enuresis, and urticaria. In these numerous cases of chronic diarrhœa it is curious to note in how few the symptom of vomiting or other acute derangement of the stomach (apart from disturbance of appetite) occurs; and this seems to be borne out by the fact that in a large number the tongue is clean. The cases of recurrent vomiting are not in their origin due to stomach disorder. In children under 6 years the condition of the teeth was excellent in a majority of cases. But no attempt has been made to deal with symptomatology, or with other important aspects of this very large and complicated subject of chronic dyspepsia in children over one year. This paper is only offered as a small contribution to the treatment of certain clinical types of the condition.

One final point may be mentioned. Emulsions of petroleum and of cod-liver oil both enjoy a reputation in the treatment of conditions of malnutrition in childhood, and in each case the reputation is no doubt deserved, but it is certain that the remedial process is quite different in each case. Cod-liver oil is a direct nutrient. Liquid paraffin has no nutritive value, and can only subserve nutrition by its ameliorative action on the digestive surfaces of the bowel. If the digestion is at fault, the use of cod-liver oil, instead of promoting nutrition, may actually retard it, by depressing the activity of secretion in the stomach; while petroleum emulsion will often quickly improve the efficiency of digestion. Where malnutrition is therefore associated with chronic dyspepsia, liquid paraffin may be employed from the outset; while cod-liver oil should, as a rule, be reserved to a later period when the dyspepsia has been overcome or improved.

STUDIES FROM THE PATHOLOGICAL DEPARTMENT
OF THE UNIVERSITY OF EDINBURGH.

CASE II.

CASE OF TUBERCULOSIS OF THE BRONCHIAL AND MESENTERIC
GLANDS, FOLLOWED BY GENERAL TUBERCULOSIS.

Day Book, 87.

Museum Book, 50, 51, 52.

The patient was a female child, aged 5 months, who was in the Children's Hospital one day. The mother stated that the child had been ill for seven days.

There was a history of tuberculosis in the families of the father and mother, but they themselves were both healthy. There were 6 other children, all healthy.

The dwelling-house was dry but not well ventilated, and it was said that the previous occupants had died of consumption.

The child was a healthy baby at birth. At the age of 4 months she had had diarrhoea which lasted two weeks; otherwise she had been healthy. Seven days ago she began to cough but still took her food and slept well; there was no fever; the day before admission she took a fit, with the following symptoms:—She cried out; the arms and legs were twisted about and seemed stiff, and she was cyanosed; the condition did not pass off for $2\frac{1}{2}$ hours. The effect of a mustard bath, which was applied for half an hour, was to give partial relief.

On the day following she was admitted to the Children's Hospital. She was cyanosed and hardly conscious: the body was stiff; the anterior fontanelle was slightly tense and pulsating very rapidly. There were no enlarged glands: respiration was difficult and at the rate of 48. The pulse was very rapid and feeble: the breath sounds were of the harsh, vesicular type, and there were crepitations, but there was no consolidation to be made out. There were little fits of choking.

On examining the nervous system it was found that the reflexes could not be obtained owing to the rigidity, and there was marked flushing of the forehead on stroking it. On lumbar puncture the fluid was found under moderate tension, and the cells were increased in number.

About $2\frac{1}{2}$ hours after admission the temperature went up, and the child rapidly collapsed.

NOTES ON THE POST-MORTEM EXAMINATION.

The specimens are:—Lungs, with bronchial glands and thymus; heart; pieces of intestine with mesentery attached; ileocaecal region; kidney; spleen; and liver; also three sections of the brain.

The *lungs* show large lymphatic glands at the roots, and these have been entirely converted into caseous matter. In some cases the necrosis has spread beyond the gland and has involved the parenchyma of the adjacent lung in caseating pneumonia. Some of the caseous masses show central softening and breaking down. An arrow has been placed on the surface of the section, and points to a caseous nodule situated immediately underneath the capsule of the thymus gland.

The tuberculous infection has spread in the lung in two ways. There has been a direct spread along the peribronchial lymphatics, taking a horizontal line from the root to the outer surface of the lungs, causing the formation of caseous areas out as far as the pleura. If the posterior aspect of the lung be examined there will be seen a mass of nodules corresponding to the areas of infection just described on the internal surface. The pleura over this mass is very much congested.

In the midst of the lowest of the series of caseous nodules, near the root of the lung, may be seen a large thrombosed vein. From the close proximity of it to these centres of infection it can easily be understood how the blood-stream would become infected and set up the general miliary tubercles which are seen scattered over the lung. These tubercles are uniformly distributed through the lung, and in this case closely resemble millet seeds in appearance. The intervening lung tissue is deeply congested, and if the pleural surface be examined it will be seen that the congestion is specially marked in a zone immediately round the miliary nodules. There is a slight amount of subpleural emphysema, especially along the anterior margins, but there is no general pleurisy. There is no tuberculous pericarditis.

The *mesenteric glands* are in a condition of caseous necrosis similar to that of the bronchial glands. The wall of the intestine in the segment corresponding with the largest mass of glands shows no lesion. The small segments have been mounted, however, to show the form of the tuberculous ulcers which were present lower down in the tract. One has been opened to show the ulcer from the mucous aspect, and the other, unopened, shows the appearance presented by the serous surface corresponding to an area of ulceration. Here may be seen marked congestion and one or two miliary tubercles.

The *spleen* shows a moderate number of small caseous tubercles of the same character as those seen in the lung. There is not, however, the same degree of general congestion of the organ. Compared with those tubercles the appearance of the Malpighian bodies is greyer and more translucent, and they show in the centre of each the blood-vessel as a little dark dot.

The *kidney* shows general pallor from anæmia and cloudy swelling, but there are no tubercles visible to the naked eye.

The *liver* shows two or three small cyst-like spaces, the contents of which are of a creamy bile-stained character, due to the fact that the

miliary tubercle situated in a portal area has softened and ulcerated into a bile-duct.

The *brain* shows very marked general congestion of the meninges. At the lower end of the fissures of Sylvius there are numerous well-defined tubercles to be seen. The membranes in the interpeduncular space are very markedly thickened throughout, but because of this thickening the tubercles are obscured.

The cut surface shows general congestion of grey and white matter. Also in the cerebral tissue bordering on the right fissure of Sylvius and elsewhere there are groups of tubercles. These have developed as a part of the meningeal infection along the perivascular lymph spaces. Close to the largest of these groups there is a well-defined mass of tubercles in the pia mater covering the outer surface.

SUMMARY OF THE CASE AND EXAMINATION OF THE MICROSCOPICAL SECTIONS.

In this case the primary nidus of infection was in the lymph glands. The bronchial glands and the thymus are affected, as well as the mesenteric glands, and it would be impossible to say which of these groups of glands was first attacked. There were no enlarged glands elsewhere. There are no definite data as regards the feeding of the child, but it was exposed to tubercle because it was living in a house where patients had died of pulmonary tuberculosis. The child also had a tendency to tubercle, because on both the father's and the mother's side of the family there was a history of tuberculous disease.

The caseous nodules in the bronchial glands are not only of large size, but they show a definite tendency to breaking down. Following on this there is to be observed a spread of the infection by the peribronchial lymphatics. This is clearly seen on the cut surface of the right lung. An oblong softening gland is seen opposite the root, and passing in a horizontal line from this to the pleural surface is a series of areas of caseous tuberculous formation. The infection has extended along the whole distribution of a bronchus; it has also found its way to the blood-stream, and has become disseminated over the whole body. The infection of the blood may occur by two modes:—First, the wall of a vein may become invaded by the tuberculosis, and the passing current of blood may become directly contaminated by the bacilli from this nidus. Occasionally an area which has softened close to a blood-vessel may rupture through the wall and pour its contents into the blood-stream. Another mode of infecting the blood is seen when, from the abdominal glands, which have formed a primary nidus, tubercle bacilli spread along the lymph channels and reach the thoracic duct; from this they are carried in the lymph to the blood-stream and are distributed by the blood.

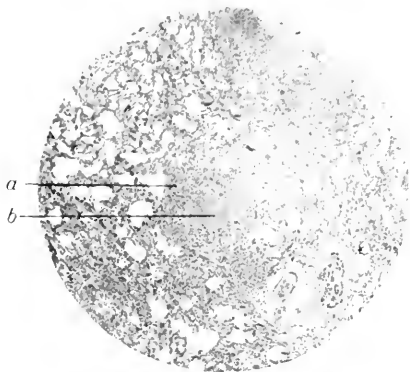


FIG. 1.—Low power view ($\times 25$ diam.) of brain. (a) in the centre there is a tubercle, round in shape, composed of alveoli filled with cellular exudate; (b) in the midst of these there is a rounded homogeneous mass of caseous necrotic tissue.

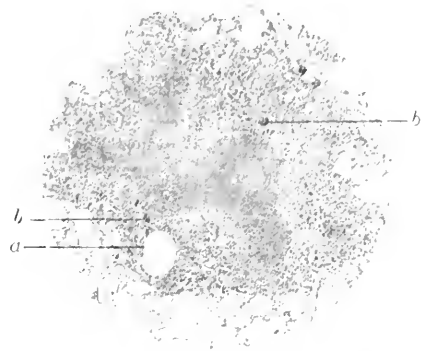


FIG. 2.—Low power view ($\times 15$ diam.) of brain. The field is largely occupied by a miliary tubercle, in which are seen consolidated alveoli surrounding an irregular area of caseous necrosis. (a) near the margin there is an inflamed bronchus; (b) amongst the alveoli several giant cells are seen situated near the margin of the necrotic area.

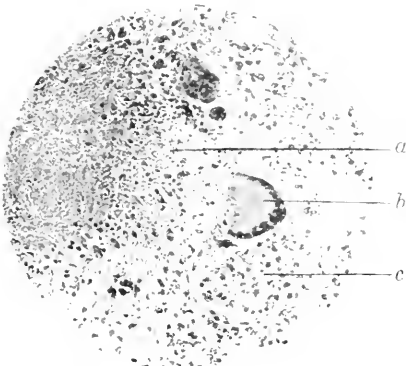


FIG. 3.—High power view of the margin of an area of caseation ($\times 200$ diam.). (a) at the margin of the caseous area scattered fragments of nuclei are seen; (b) outside the area there is a large giant cell with numerous marginal nuclei; (c) near this cell is an alveolus filled with cellular exudate.



FIG. 4.—Low power view ($\times 15$ diam.) of a silens of the brain showing miliary nodules of tuberculolysis situated in the pia-arachnoid membrane. The blood vessels are cut in cross section, and the tubercles are seen situated in the perivascular lymphatic spaces. There are no tubercles in the nervous tissue.

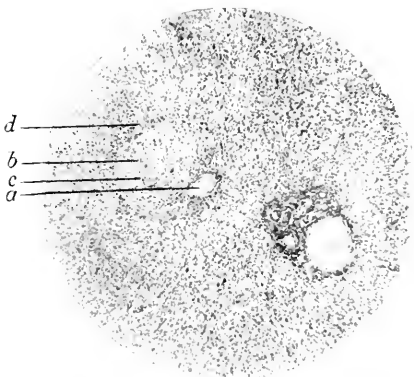


FIG. 5.—Low power view ($\times 60$ diam.) of a section of the liver, showing one small miliary nodule of tubercle situated in a portal area—(a) the portal vein is seen cut in transverse section; (b) there is a slight amount of central necrosis; (c) near this is situated a giant cell; the rest of the nodule is fibrocellular in character; (d) at the periphery there is a zone of lymphocyte-like cells. The liver epithelium is in a state of advanced fatty degeneration.



FIG. 6.—High power view ($\times 1000$ diam.) of a section of lymph gland. The section has been stained by carbol-methin to show the presence of numerous tubercle bacilli in the cellular tissue.



It is not clear in this case how the infection was conveyed to the blood from the primary foci (thoracic and abdominal). The blood infection has led to the formation of miliary nodules in the lung, brain, spleen, and liver, but there are none visible in the kidney, nor do the sections show any other changes than those of cloudy swelling.

Lungs.—In general tuberculosis the appearance of the lung varies according to the number of foci. In the present case they are moderately numerous and of medium size, and though groups may be found here and there, they are fairly evenly distributed.

The microscopical section shows the characteristic appearances. In the earliest stage the nodule consists of a group of alveoli filled with catarrhal exudate. Note the abundance of large alveolar cells which have been cast off; the congestion of the capillaries; the scarcity of polymorph leucocytes or lymphocytes among the alveolar cells. Some of the large alveolar cells show two or three nuclei. There is also comparatively little fluid exudate, but mingled with the other cells there are numbers of red corpuscles, and here and there a giant cell is to be found. At a later stage of the process the centre of the area has become necrosed, and it has had a homogeneous, finely granular appearance. It is impossible to make out the structure in the area of necrosis: the whole of the elements present have been converted into a mass of caseous matter. Around the border of this area of caseation the lung tissue shows a zone of catarrhal consolidation, congestion, and extravasation of red blood corpuscles.

The catarrhal pneumonia in these areas is due to the deposition of tubercle bacilli from the circulating blood. A question to consider is where the deposition takes place. It may be in the lumen of a capillary where the bacillus or a group of bacilli become arrested; a thrombus forms, and the bacilli embedded in the coagulum grow and at the same time give off toxin, which causes inflammation in the surrounding tissue to which the toxin diffuses. In other cases the bacilli may pass into the perivascular spaces and find a nidus of development there. In such cases the bacilli are probably carried by leucocytes through the capillary wall.

As a result, in either case, congestion and catarrhal pneumonia occur in the alveoli, and the size of the area affected depends on the amount of toxin given off or the time for development. When the number of bacilli poured into the blood is large there are numerous tubercles in the lung, and they are of small size. When the number of bacilli is smaller the tubercles are few and develop slowly, but may reach a larger size. Differences also arise in other ways; the disposition of the patient and the relative virulence of the bacilli in different cases may also give variations in the appearances.

In this case the infection of the blood-stream has arisen from the foci in the bronchial glands or from the areas in the thymus. These

are seen partially softened and breaking down, and this leads naturally to the spread of the tubercle bacilli from the necrosed areas.

The Brain.—The microscopical section shows intense congestion of the meninges, infiltration of leucocytes, and the formation of caseous tuberculous nodules in the sulci. These nodules show very marked karyorrhesis, and at the edge here and there are to be found amongst the lymphocytes numbers of very large endothelial cells. The brain tissue immediately outside the nodule is congested and softened. There are no giant cells in the tubercles found in the sulci. It should be noted that in the section examined the tubercles are round the vessels in the membranes in the perivascular spaces, not in the cerebral tissue. Tubercle bacilli in small groups or single are to be found in the necrosing area.

The *liver* shows a large amount of fatty degeneration, and the tissue is studded with small tuberculous nodules, some of which are of a fibroid character, showing numbers of giant cells and very little caseation. A number of these can be seen close to bile ducts. A few tubercle bacilli are to be found in the foci.

In the *spleen* the tubercles are very numerous, and show large giant cells and a considerable amount of caseation. There are comparatively few bacilli to be found in the tissue.

The section of *lymph gland* shows a multitude of areas of necrosis affecting practically the whole of the tissue, but not showing either endothelial cell or giant-cell formation. The carbol-fuchsin stain shows that the gland is swarming with tubercle bacilli.

The *kidneys* show cloudy swelling of the tubular epithelium, but there are no tubercles, and no tubercle bacilli have been found arrested in the glomeruli.

Attention should be given to two small segments of *small intestine*.

Tuberculous ulcers of the intestine are usually secondary to tuberculosis of the lung and the swallowing of infected sputum. In this case, however, there were no tuberculous cavities in the lung, and it seems probable that these recently-formed ulcers may have arisen from the general blood infection.

In this case the cause of death was primarily the tuberculous meningitis. This form of meningitis causes intense congestion of the meninges, and the accumulation of fluid in the pia-arachnoid, and to this and to oedema of the brain are due the symptoms of excessive brain pressure. The formation of tubercle nodules, and especially of those in the sulci, with the congestion and softening of brain tissue to which they give rise, is the cause of symptoms of cerebral irritation. Apart from this there is also the active tuberculosis of the lungs and the toxæmia to which the general tuberculosis gives rise. And, lastly, there is the active process of ulceration of the intestine.

The characteristic of tuberculosis in the child as compared with the adult is its tendency to spread and rapidly develop in generalised form.

This condition is well exemplified in the present case.

For permission to publish the clinical account of this case I have to thank Dr. J. Thomson, F.R.C.P. J. LORRAIN SMITH.

THE BRITISH PHARMACOPEIA, 1914.

By GEORGE LUNAN, F.C.S.

AFTER sixteen years a new edition of the British Pharmacopœia has been published, and becomes the official standard for Great Britain and the Dominions overseas. The Indian and Colonial Addendum of 1900 is now incorporated in the British Pharmacopœia of 1914, which therefore represents the nation without differentiation. This is a right and opportune advance, and expresses at this time a further unity of purpose.

Doubtless the publication of the British Pharmacopœia has a disturbing influence on practitioner and pharmacist alike, and certain readjustments, alterations, and additions have to be met, and a familiar knowledge acquired, so as to prevent confusion and error. It will take time and care to effect this, with some possibilities of want of uniformity in minor details.

The Additions.—These number forty-three, and, in most cases, are familiar preparations and substances which have justified their inclusion. Why should acetylsalicylic acid be prescribed under any trade name—British or foreign—when we have a standard of purity for it? Adrenalin has a well-defined therapeutic use. Barbitone, familiarly known as veronal, calcium lactate, chloral formamide for chloralamide, cresol, diamorphine hydrochloride for heroin hydrochloride, ethyl chloride, guaiaccol carbonate, hexamine for urotropine, solution of adrenalin chloride, solution of cresol with soap, solution of formaldehyde, solution of formaldehyde with soap, methyl salicylate, methylsulphonal for trional, phenolphthalein, resorcin, acid sodium phosphate, and strontium bromide, are all of the same category. On the other hand, pelletierine tannate is infrequently prescribed in Edinburgh.

Taken as a whole, the Committee have not been over-diffuse

in adding to the monographs. Galenical preparations, such as compound syrup of the hypophosphites and compound syrup of the glycerophosphates, which are in constant use, might have been included. Calcium and sodium glycerophosphates might have been added. When "discs" have a place, surely compressed tablets might have had a few examples and a general process stated. In this way there would be defined for general guidance the class of substance suitable for exhibition in this form, and the indication made that many things presently prepared in this way are not to be sanctioned and approved. The writer has had given to him for investigation *feces* which contained undisintegrated bismuth salicylate tablets.

Deletions.—For every addition, four preparations, drugs, or chemical substances have been omitted. Most of these are obsolete and will be parted with, without regret. Many of these have the standards of the 1885 and 1898 British Pharmacopœia, and so have this semi-official recognition and standardisation. Very few will regret the omission of the "concentrated liquors," which were very rarely prescribed. One regrets the exclusion of hops and infusion of hops. Most of the plasters omitted were very little prescribed, but it will take the test of time to prove that cantharidin plaster is an improvement on the familiar cantharides plaster. Passing from an indefinite to a definite standard should be an improvement. It is regrettable that no rubber plasters are monographed, but the mechanical appliances necessary for their production on a small scale has proved a fatal bar to their inclusion. There is no reason why a liquid celloidin preparation or liquid rubber combinations should not have the imprimatur of pharmacopœial recognition. On the other hand the ophthalmic discs (*lamellæ*) might well have been dispensed with—given, as they have been, four monographs and a process in the Appendices—for they are very infrequently prescribed and not comparable in any respect with freshly-prepared sterile solutions. The following substances omitted are still in frequent use:—Cerium oxalate, saffron, elaterin, compound pill of galbanum, sodium sulphocarbolate and zinc sulphocarbolate. The Committee, in dealing with deletions, would be largely influenced by representations from various authorities, and, taken as a whole, the expunging of most of the paragraphs will be welcomed by practitioner and pharmacist alike.

Alterations in names need hardly be referred to except in groups. Thus the alterations in the names of simple drugs are

modifications towards more exact definitions of, in most cases, the general source of supply, *e.g.*, "Aloe Barbadosensis et Aloe Socotrina" become "Aloe," "Oleum Pini" becomes "Oleum Abietis," "Senna Alexandrina et Senna Indica" become "Sennæ Foliæ"; or greater purity, *e.g.*, "Adeps" "Adeps Preparatus," "Alumen," "Alumen Purificatus," and so on.

In galenic preparations the alteration in names is due to modifications of the processes. Thus *extractum belladonnæ alcoholicum* becomes *extractum belladonnæ siccum*; *extractum cascariæ sagradæ*, ext. casc. sag. siccum; *extractum nucis vomicæ*, ext. nuc. vom. siccum; and *extractum opii*, ext. opii siccum.

This is due to the modification of the processes whereby they are now presented as dry extracts. Already this alteration has commended itself to frequent use for obvious reasons, chief of which is that they can be compounded into pills without unduly increasing their size, into cachets or powders without rendering them inconveniently moist, and, above all, making their manipulation quick and convenient. The alteration must commend itself more and more to the medical practitioner from the possibilities of prescribing where formerly they were inadmissible. Extracts of *hyoscyamus* and *eunonymus* are dry extracts, and the former has for the first time been standardised to contain 0·3 per cent. of alkaloids. This standardisation of extract of *hyoscyamus* is certain to meet with general approbation and to ensure the steady therapeutic value of this much-prescribed excipient for pills. Here also it may be stated that *nux vomica* powder has now been standardised to contain 1·25 per cent. of strychnine, so that it can now be prescribed as containing a definite percentage of strychnine and—although not determined—brucine, in combination with the natural acids of the seeds. That *ferrum tartaratum* and *sodium tartaratum* should be now correctly stated as "*ferrum et potassii tartras*" and "*sodii et potassii tartras*" is on a par with the whole tendency of the British Pharmacopœia to name substances according to their true composition. In this connection it would have been an improvement to substitute glycerin of glyceryl-borate for glycerin acidi boricæ. It is indeed a solution of one part of glyceryl borate in glycerin, and only yields free boric acid when applied to a moist aqueous surface. Therein no doubt lies its therapeutic value, not yet fully appreciated, for the production of nascent acid has curative properties that a mere solution cannot have. None of the proprietary preparations of glycerin and boric acid

are comparable with it, because they are varying mixtures containing performed precipitated boric acid.

Alterations in Composition. — These are somewhat important in many cases, and require to be carefully noted. Thus belladonna leaves freed from branches are standardised in accordance with the International Agreement, 1906 (of which something will be said presently), to contain 0·3 per cent. of alkaloids. Confection of sulphur has precipitated sulphur in place of flowers of sulphur, compound decoction of aloes loses its saffron and is further changed by the alteration in compound tincture of cardamoms. Dried extract of belladonna made from leaves replaces alcoholic and green extracts of belladonna. Extract of ergot is prepared by a new process. Extracts of hyoseyamus and nux vomica have already been referred to.

Saccharated ferrous carbonate now contains 50 per cent. instead of 33 per cent., with a vehicle of glucose for sugar. This will ensure the better preservation of the powder from oxidation. Black mercurial lotion has shed its mucilage of tragacanth, which in practice has been found worse than useless.

Phosphorated oil is now flavoured with oil of lemon. Liquid paraffin, which has now assumed great therapeutic use, is not, strictly speaking, altered in composition, but has been altered in the range of specific gravity from 0·885 to 0·890 in 1898, to from 0·860 to 0·890 in 1914, and affords the thinner as well as the thicker fluids formerly only official. In this connection it is not well established which has the greater therapeutic value, but for spray solutions the thin is much to be preferred because of the easier nebulising properties, while the thick variety may be preferred by some as less nauseating. It is undoubted that the thick conveys the sense of any impurity of smell much less readily to the palate. When absolutely pure and free from smell the lighter product should be more mobile and active in every respect.

There are a number of preparations where the alteration in composition is mainly one of change in strength, but they are sufficiently important to require noting by themselves under alterations in potency. Glucose has been added to syrup of ferrous iodide to preserve it. Compound tincture of cardamoms is prepared with weaker alcohol and has the raisins replaced by glycerin. This should improve the compatibility but not the flavour. The bases of various lozenges have been improved. Carbolic acid ointment has been reduced in strength so as to

ensure a uniformly homogeneous product. A considerable advance has been made in the ointment bases so as to suit, as far as possible, the particular purposes of the medicaments. Somewhat drastic changes in strength are made, while cantharidin has been substituted for cantharides as in the plaster and tincture, entailing a change in nomenclature in all three preparations. The addition of borax to the rose-water ointment is a distinct improvement, and the basis can now be medicated with less chance of throwing out the rose water, and the keeping properties are improved. Hamamelis ointment by the alteration of the basis is distinctly improved. There are many minor alterations in composition, all of which will be found in practice to have been the result of careful experimental work.

The writer would have been glad to have seen a more practical process introduced for the preparation of effervescent granules. While this may not come under the heading of "alterations in composition," it would have altered the appearance of the products, so that they would have been unrecognisable when compared with the resultant products of the present monographs. It is very probable that the comparative unpopularity of this mode—eminently suitable for many drugs—of exhibiting medicaments in the granular effervescent form, is due to the want of uniformity which the present process produces. What is desired is a uniform, thoroughly dried and therefore absolutely stable, evenly and rapidly soluble, and highly effervescent granule, yielding an invariable weight by measure. This cannot be produced by the present process, which yields powder, lumps the size of a pea, and intermediate granules, which dissolve unevenly, cannot be absolutely dried and so will not keep for any length of time, and cannot be measured because of the varying interstices. Space could have been saved by giving a process in the Appendices for the manufacture of all effervescent granules, and one or two additions made to the number, such as potassium citrate and sodium bicarbonate effervescent, without occupying nearly so much space as the present repetition of the process—the greatest anachronism in the British Pharmacopœia—entails.

The new process for solution of bismuth is a great improvement, and the product keeps well.

Alterations in Potency.—This is so important as to require tabulating—minor alterations are not included.

STRONGER.

Acetum scillæ, double strength.
 Linimentum opii, one-third stronger.
 Spiritus juniperi, double strength.
 Syrupus chloral, about one-tenth stronger.
 Syrupus codeinæ, about one-tenth stronger.
 Tinctura aconiti, double strength.
 Tinctura camphore compositæ, one-tenth stronger.
 Tinctura opii, one-third stronger.
 Tinctura strophanthi, four times stronger.
 Unguentum hydrargyri subchloridi, double strength.

WEAKER.

Acida nitrici et phosphorici et sulphurici, all made 10 per cent.
 reduced variously one-fourth to two-fifths.
 Emplastrum belladonnæ, one-half strength.
 Injectio cocainæ hypodermica, one-half strength.
 Injectio morphinæ hypodermica, one-half strength.
 Liquor hydrargyri perchloridi, one-eighth weaker.
 Pilula phosphori, one-half strength.
 Syrupus ferri iodidi, about two-thirds former strength.
 Tabella trinitrini, each tablet $\frac{1}{150}$ instead of $\frac{1}{100}$ grain.
 Tinctura belladonnæ, reduced $\frac{2}{3}$ in strength.
 Tinctura colchici, one-half strength.
 Tinctura digitalis, one-fifth weaker.
 Tinctura nucis vomicæ, one-half strength.
 Trochiscus acidi carbonici, one-half strength.

The most remarkable and at the same time dangerous alteration is the fourfold increase in tincture of strophanthus. The history of this tincture introduced by Sir Thomas Fraser is remarkable. Included in the 1885 British Pharmacopœia of the strength of 1 in 20, made by the ether and spirit 90 per cent. process; altered in the 1898 British Pharmacopœia to the spirit 70 per cent. process only, strength 1 in 40; and now included of 1 in 10 strength by the ether spirit and 70 per cent. process, surely variation enough. The compilers must be granted the excuse of endeavouring to make it agree with the international standard. In doing so, they have thrown the door open to grave risks, and it is doubtful if this would have been done had the present state of international agreement been foreseen. It is probable that when the next British Pharmacopœia appears conditions will be so secure that more complete international agreement in standards will be adopted. Meantime it might have served the purpose to have returned to the 1885 standard and then the transition to the international standard would have been less revolutionary at a future time. It is notable that tincture of

opium (laudanum) will now require the prescription of a medical practitioner or a signature openly attested in the Poisons Schedule Book before it can be given out. This arises from the morphine constituent being raised to 10 per cent. Tincture of nux vomica reduced to half strength will require careful note particularly by the pharmacist, who, for some time to come, will have to keep both 1898 and 1914 standards. The same applies to a great many potent drugs that have been altered.

Weights and Measures.—It is to be expected that the drastic adoption of the metrical weights and measures will be strongly criticised. Unfamiliarity and want of experience in thinking in them will make the change highly unpopular. The writer, however, believes that the compilers were fully warranted in adopting the change. Gradually, since the 1867 British Pharmacopœia, the wedge has been slowly driven in, and in due time—probably a good many years—we will have the system for the dispensing of medicines. It already obtains for all scientific work, and has done so for years. Now the manufacturing will be done by the decimal system in ever-increasing proportion year by year. It may seem an anomaly to prepare our medicines by the decimal system, and dispense them by our Imperial apothecaries' system of weights and measures. The preparations, however made, are identical, and to the majority who will continue to prepare them by the Imperial equivalents of the metric weights and measures solely stated in the British Pharmacopœia, it is somewhat of a grievance that they are not stated. Time will modify this feeling, and whenever the official system is tried it will surely commend itself by its simplicity and consequently greater freedom from possible error, and so will be finally persisted in and adopted. The Continental system includes the weighing of solids and liquids as well, but the British system of solids by weight and liquids by measure has been wisely maintained and will cause no variation of moment, although contrary to the International Agreement. At present, criticisms of any apparent concessions which have had a disturbing effect on some of our most potent preparations, *e.g.* tinctures of nux vomica and strophanthus, to the International Agreement will be accentuated by the present condition of strife, yet it will be admitted that the compilers were wise in endeavouring, where possible, to meet the desire for uniformity. There has been no more than preliminary steps towards that end.

Dosage.—The metric doses have necessarily followed the adop-

tion of that system for weights and measures in the monographs. Much criticism will be evoked as to their inclusion, and most of us would have preferred them to be placed second. More criticism will be exercised over the adoption of the millilitre (mil) for the cubic centimetre, but on this point it will be found that a wise decision has been made, and close consideration will show that the term is much more suitable for fluid measures than the cubic centimetre (c.c.) and its decimal fractions. Millilitre, decimillilitre, and centimillilitre afford much more clear contraction than cubic centimetre, decicubic-centimetre, and centicubic-centimetre. With more use the terms "mil," "decimil," and "centimil," equal to 16·9, 1·69, and 0·169 minims will become familiar. No doubt time is needed before prescriptions will be commonly written in these fluid terms. It involves many changes in the size of bottles, in the number of doses prescribed, and many other consequent changes. There the decimal system would assert itself in prescriptions for five, ten, fifteen, and twenty doses instead of four, eight, twelve, and sixteen doses. In the use of grams, decigrams, centigrams for solids for pills, powders, and cachets the same sequence of five, ten, and twenty for six, twelve, and twenty-four. It is useless arguing that the simplicity of the decimal should insure a ready adoption of the system, and it is admitted that the change can only come gradually. Only continuous handling of these weights and fluid measures can convince how greatly and simply superior the system is to ours.

Tests.—It is outside the scope of this article to deal with this stupendous subject, but attention is directed to the very careful work which has been included in the British Pharmacopœia regarding the limit of arsenic and lead in chemical substances used in medicine. This will be found to be, as it should be, a very carefully considered standard on which great experimental study has been expended. It is generally known that a bismuth meal of two or two and a half ounces, say 1000 grains, if taken at the arsenic limit for bismuth salts in the British Pharmacopœia, would give a dose of $\frac{1}{500}$ grain of arsenic; and the importance of the point of a limit being carefully defined for ordinary dispensing is emphasised by the fact that the bismuth for the meal is prepared with a 1 in 3,000,000 limit. The arsenic and lead limits are therefore typical of the accurate tests so clearly defined in the Appendices.

General Summary.—There is no finality in the Pharmacopœia. The work of revising, improving, and advancing begins again with

its publication. Immediately a horde of critics, medical and pharmaceutical, will assail it. The compilers are fully aware of this, and, indeed, expect it. There can be no doubt of the pains and care which have been used in compiling it. A strong plea is presented that it is a national book of medicine. It represents to the practitioner the official guide to his prescriptions, because it represents only ascertained and tried *Materia Medica*. These are protected by practical standards for his use.

In the multitude of publications dealing with applied medicine the 1914 British Pharmacopœia stands by itself, typical of the nation, stubbornly progressive, accurate and reliable.

REPORTS OF SOCIETIES.

Edinburgh Obstetrical Society.

THE second meeting of the seventy-sixth session was held on Wednesday, 13th January 1915, the President, Sir Halliday Croom, in the chair.

Sir Halliday Croom delivered his presidential address, in which, after thanking the Society for the honour done to him in electing him for the third time to the presidential chair, he discussed some of the problems which await solution at the hands of the obstetricians of the future.

One of the first questions upon which he touched was the position of women in scientific work. In this connection he referred to the work of Mesdames Curie and Victoire Henri, and briefly discussed the place of radium therapy in gynecology.

The decline of the national birth-rate was next taken up. Reference was made to the work of Dunlop, who drew attention to the significance of delay in marriage, especially on the part of the woman. As compared with twenty years ago in Scotland there is now one child less per marriage for all ages of the mother under thirty-six (excepting thirty-two). The mortality of infants born of women who are in active employment during pregnancy was also mentioned in this connection, and emphasis placed upon the fact that the mortality amongst such children is 62 per cent. higher than among the children of mothers who are not at work.

The possibilities for obstetrics and for medicine generally contained in the theories propounded by *Abderhalden*; the ultimate benefits or risks of *salvarsan*; the origin and treatment of cancer; and the cause of eclampsia, were amongst the important questions that remain to be settled in the near future.

Sir Halliday Croom put in a strong plea for a more general recourse to private hospitals in all cases where complications were to be anticipated in labour. In this way only could the results of midwifery practice in private be greatly improved. Pre-maternity beds in hospital were also a matter of very great importance to the nation.

Dr. Keppie Paterson, Senior Vice-President, moved a hearty vote of thanks to Sir Halliday Croom for his address, which had been characterised by the personal element and charm with which in that Society they were all so familiar. He had touched upon a large range of subjects, and his ripe and matured judgment had shed light upon all of them, and provided his hearers with much food for interesting thought.

RECENT ADVANCES IN MEDICAL SCIENCE

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., J. D. COMRIE,
M.D., AND ALEX. GOODALL, M.D.

PERIARTERITIS NODOSA.

LAMB (*Arch. Internat. Med.*, October 1914) describes two cases of this uncommon condition which occurred in his clinic, and reviews fully all the reported cases and the known facts about the condition. Thirty-eight cases in all have been recorded. Various names have been suggested for this disease. Kussmaul and Meyer, who gave the original complete description of the condition, called it periarteritis nodosa. Otherwise it is known as polyarteritis nodosa, panarteritis, meso-periarteritis, etc.

Periarteritis nodosa is essentially a disease of adolescence and early adult life, though the ages in the recorded cases range from 2½ months to 57 years. It is three times more frequent in males than females. No apparent connection between antecedent conditions and periarteritis has been established. The symptoms are very varied, and may begin anywhere, according to the district or region of arteries involved. Pains in the muscles and joints are very constant; there is usually fever, often abdominal epigastric pain, œdema, diarrhœa, purpuric eruptions, and in addition general symptoms, viz. dizziness, cyanosis, dyspnoea, etc. The presence of subcutaneous nodules is important. Two cases were diagnosed during life by the examination of excised nodules, and probably their presence is the only certain means of diagnosis. They may appear anywhere—limbs, trunk, or face. Pains in the joints—involving more than one joint, and affecting joints in groups as in acute rheumatism—are usually present. Pains in the muscles of the extremities are common.

Anæmia is marked in many of the cases of the secondary type. Leucocytosis is the rule, varying from 9000 to 66,000 per c.mm. with, in most cases, a marked eosinophilia. Gastro-intestinal symptoms—vomiting, diarrhœa, or constipation—are common. Abdominal pain is important, as in some of the cases described it was thought that an acute surgical condition was present. The pain comes in attacks, is severe and colicky, but may be constant, and often localised to the epigastrium.

In all cases the condition attacks the small arteries of the kidney, and symptoms accordingly are constantly present. Albumin is present

in varying amount, sometimes constantly, but may disappear and reappear. Hyaline and granular casts are found, and in some cases blood is present.

Pathology.—The varied clinical phenomena depend on the arterial nodules and aneurisms found scattered through the arterial system, which produce an insufficient blood supply to the various organs. Periarteritis nodosa does not affect the larger arteries, but only those the size of the coronary and smaller. The arteries of the brain and spinal cord and those of the lung are very rarely affected. In all the cases the lesions were found in the heart, gastro-intestinal tract and kidneys.

It is to be noted that in some of the cases—clinically coming under this disease—no gross changes could be seen in the arteries, and it was only the microscopical sections which revealed the condition.

Solid nodules in the arteries and aneurisms are both present. Both occur at points of branching of arteries. The nodules are whitish or yellowish-white, and vary in size from those resembling miliary tubercles to those the size of a pea. The largest nodules are aneurisms, which are filled with thrombus and may be as large as a hazel nut. The arteries may be occluded at the site of the lesions, thus causing infarctions in the organs.

The process, all observers are agreed, does not begin in the intima, but opinion is divided as to whether the media or adventitia marks the origin of the condition. The intima is frequently not involved at all, and when involved is always accompanied by changes in the other coats. The change in the intima is one simply of proliferation of endothelial cells, which at times may be so great as considerably to narrow the lumen. The middle coat is always involved. The muscle cells swell and lose their nuclei. This is followed by an exudate of polynuclear leucocytes and eosinophils, followed by degeneration of the muscular coat. In the adventitia alone may be found signs of the process, and the earliest change is a collection in the coat of mononuclear wandering cells, polymorphs, and eosinophils. Lamb has been much struck by the persistence and abundance of eosinophils in the lesions, and thinks this fact may afford some help as to the aetiology of the condition. The infiltration of cells in the adventitia increases until the coat becomes much thickened. The adventitia degenerates and goes on to form granulation and ultimately fibrous tissue.

The duration of the condition is, on the whole, short, and the prognosis is very bad, all the cases recorded except one dying of the disease.

The condition, he thinks, must be considered as a distinct entity, though the diagnosis is by no means easy owing to the widespread involvement of the arterial system, and the corresponding multiplicity and variation of symptoms. Up to date a diagnosis during life has

been made definitely only by the excision and examination of the characteristic nodules.

Lamb thinks that with such a symptom-complex—fever of more or less irregular type, rapid pulse, often very rapid, anæmia with progressive weakness, a striking polymorph leucocytosis, plus an eosinophilia—one should suspect a periarteritis, and particularly if in addition one has œdema and signs of nephritis and also gastro-intestinal symptoms.

The appearance of subcutaneous nodules and their examination, of course, settles the diagnosis.

THE SIGNIFICANCE OF THE THYMUS GLAND IN GRAVES' DISEASE.

Halsted (*Johns Hopkins Hosp. Bull.*, August 1914) sums up the evidence—clinical and experimental—which suggests a connection between the thymus and Graves' disease. He thinks that, having followed the course of many cases of exophthalmic goitre—particularly those operated upon—the thymus plays an important and sometimes the chief rôle in the condition; and all surgeons have learned that in a percentage of cases the cure of exophthalmic goitre may be incomplete even after resection of the greater part of both lobes of the thyroid gland. The symptoms of Graves' disease have been analysed and grouped as sympathetico-tonic, *e.g.* pronounced exophthalmos, Möbius' sign, Löwi's phenomenon positive, dry bulbs, etc., and vagotonic symptoms, *e.g.* von Graefe's sign, wide-lid clefts, increased lachrymation, etc. In certain cases of this condition there is great emaciation, sweating, diarrhoea, only slight exophthalmos, small goitre and frequently a bronzed skin, with not much tachycardia. These may be the chief symptoms, and it is suggested that in such cases the thymus secretion plays a part.

Pathologically it is found that in cases of exophthalmic goitre which have died from some intercurrent disease there is persistence of the thymus in 82 per cent., and in cases which have died of heart failure after operation enlargement of the thymus has been found in 95 per cent. If the clinical and pathological facts be as stated, then benefit ought to be obtained in cases of Graves' disease by dealing with the thymus as well as the thyroid. Halsted discusses the cases in which this has been done. Garrè was the first to deal with the thymus only in cases of exophthalmic goitre by excising it. This he did in three cases with excellent results. The tachycardia and emaciation disappeared, as did also the typical Kocher blood picture—the lymphocytes falling from 40 to 10 per cent. Others have published similar successful results, and a number of successful cases have been recorded where a combined operation was undertaken and excision or partial excision of both thyroid and thymus. Halsted himself has

obtained good results from the combined operation, and thinks that at present this is the treatment that holds out most hope of success.

Sufficient observations have not yet been made to enable us to say definitely which of the symptoms of Graves' disease imply involvement of the thymus, and consequently its removal. The typical lymphocytic blood-picture is probably a thymus symptom, and so, too, is the pigmentation of the skin. And when it is definitely decided which symptoms indicate thymus involvement, probably X-ray application will be better treatment than operation, for many observers have shown that the thymus rapidly undergoes involution under its influence.

THE VALUE AND SIGNIFICANCE OF BLOOD-PRESSURE ESTIMATIONS.

Numerous papers have been appearing dealing with the question of blood-pressure—attempting to focus our knowledge as to its value and significance in disease. Three of these papers are specially important. Worfield (*Amer. Journ. Med. Sci.*, December 1914) writes on diastolic and pulse-pressure.

The auscultatory method of Korothar he considers the most accurate method for estimating blood-pressure. It gives both systolic and diastolic pressures, and he particularly insists that the diastolic is all-important, measuring as it does the peripheral resistance, and as a diagnostic and prognostic datum this is much more helpful than the knowledge of systolic pressure, which only measures the maximum force of the heart. The pulse-pressure (which can only be measured by ascertaining the diastolic pressure) is the difference between the systolic and diastolic pressures, and for normal adults should be from 40 to 50 mm. Hg. Variations in pulse-pressure occur in many diseases. The highest pulse-pressure we know occurs in aortic incompetence. When the systolic pressure is normal, increased pulse-pressure signifies peripheral dilatation. When the systolic pressure is high an increased pulse-pressure is to be regarded as normal. Decreased pulse-pressure means marked peripheral constriction, and is therefore an unfavourable prognostic sign. In acute fevers a low pulse-pressure means a diseased heart and an unfavourable prognosis. With a normal systolic pressure a falling pulse-pressure means cardiac failure.

Janowski writes (*Zeitschr. für klin. Med.*, vol. lxxx., Nos. 5 and 6) on blood-pressure and pulse-pressure in arteriosclerosis and nephritis. An editorial on this paper appears in the *Medical Record* for 7th November 1914, and in the *Medical Record* for 14th November 1914. Professor Richter of St. Louis discusses mistakes made in taking and interpreting blood-pressure findings.

He discusses, as Janowski does, the question of arteriosclerosis and blood-pressure. Both agree that in some cases of arteriosclerosis the blood-pressure is high, in some it is normal, and in some it is low, and

that these facts are not generally understood. Janowski studied 200 cases of arteriosclerosis, and in 72 per cent. the blood-pressure was raised. These cases, they point out, are easily understood. Those cases where the blood-pressure is not raised can be explained by impairment of the heart, and in such persons angina pectoris is more common than in arteriosclerotics with hypertension. Janowski considers, therefore, that arteriosclerosis with a normal pressure is a serious condition, and one to be watched carefully. Janowski studied 100 cases of nephritis with no arteriosclerosis. As is known, cases of acute nephritis have hypertension, particularly on the appearance of uræmic symptoms, and a very high pressure leads one to suspect the onset of uræmia.

In chronic nephritis 84 per cent. of his cases had raised blood-pressure. The remaining 16 per cent. gave normal readings. This latter fact, especially if taken in conjunction with results obtained from tests of kidney function, inclines him to dispute and doubt the present method of classification of nephritis. He suggests a classification of nephritis as follows:—

1. Cases with a varying amount of albumin, casts, and blood-cells in the urine, which show no signs of renal disease, except at the terminal stage.

2. Cases with chloride retention, having œdema, vomiting, obstinate headache, convulsions, coma, etc.

3. Cases with symptoms of nitrogen retention. These have no œdema, but anorexia, vomiting, stupor, retinitis, etc.

4. A group of cases with high blood-pressure from the outset, obstinate headache, tinnitus, disturbances of vision, muscular twitchings. The heart becomes greatly enlarged, and in time signs of chloride or nitrogen retention or of cardiac insufficiency develop, and it is in these cases we get cerebral hæmorrhage, epistaxis, hæmaturia, etc.

Richter agrees that nephritis cases will become more easily understood and treated if some such classification be adopted. He thinks the types which show nitrogen and chloride retention are, perhaps, not primarily kidney diseases—the former being, he suggests, due to a metabolic disturbance, and the latter to disease of the vascular intima.

A. G.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

THE CHOICE OF OPERATION IN CHRONIC GASTRIC AND DUODENAL ULCERS.

In discussing this weighty subject Sherren treats it in a very clear and instructive manner (*Surg., Gynecol. and Obst.*, November 1914).

Axioms laid down by him are worthy of consideration. He says at the commencement of his paper that the operation to be performed in any individual case of chronic gastric ulcer can be decided upon only after the abdomen is opened, and it is only by one's own experience, and to a less extent by reading the experience of others, that any rules may be laid down. In his opinion, also, there is good ground for the belief that ulcers of the stomach and duodenum are associated with, and secondary to, disease in and around other viscera, particularly the appendix. Thus in every gastric case it is clear that the whole abdomen should be thoroughly examined and in most cases the appendix removed, unless the patient be seriously ill from hæmorrhage or perforation. The author tells us how he omitted this in his earlier cases, and how he has since had to operate on these patients for the removal of gallstones or for chronic appendices overlooked at the former operation.

In chronic duodenal ulcer the author infolds the ulcer when it is in its usual situation on the anterior wall, and performs posterior gastro-jejunostomy. He finds that gastro-jejunostomy gives better results than any other operation. The only trouble after operation in his whole series of cases was the development in 2 per cent. of cases of jejunal ulcer; all these patients, however, recovered after a second operation. In acute perforation of a chronic duodenal ulcer he stitches over the ulcer or excises it, and then performs gastro-jejunostomy. Gastro-jejunostomy is an essential part of the treatment, and ought to be performed if the patient is not too ill. If it is not done and the patient recovers, then it is necessary to perform gastro-jejunostomy at a later date in order to cure the condition permanently. Relapses often occur in those cases where the ulcer is excised without performing a gastro-jejunostomy. Some state that while gastro-jejunostomy is a satisfactory procedure in cases of chronic ulcer producing pyloric stenosis, it has not been successful when the ulcer is situated elsewhere. Such, however, is not the experience of Sherren. He states that simple gastric ulcers, wherever situated, will heal after gastro-jejunostomy properly performed unless the ulcer has perforated and has its base formed by pancreas or liver, as in that case no contraction can take place and give sound healing. This statement he has proved in a series of cases in which he examined the ulcer again, either at a subsequent exploratory operation during life or at a *sectio*. In all his cases of small ulcers he performs a no-loop vertical posterior gastro-jejunostomy into the pyloric segment of the stomach and invaginates the ulcer with a mattress suture of silk. If the ulcer be large or fixed, or if there be a suspicion of malignancy in its character, he prefers a partial gastrectomy to excision and gastro-jejunostomy. If he has excised the pylorus for ulcer or malignancy he performs a type of anastomosis that we have never seen mentioned before. He closes the duodenum completely and brings the jejunum at its origin

through an opening in the mesocolon, and anastomoses it directly to the divided cardiac end of the stomach. He has had good results from this method, and uses it because it is shorter than closing both divided ends and doing a posterior gastro-jejunostomy.

The author is very emphatic in two statements:—(1) In no instance has he found it necessary to exclude the pylorus. (2) In no case operated upon for chronic gastric ulcer by gastro-jejunostomy alone, in which he had no doubt as to the simple nature of the lesion, has carcinoma developed. Thus although he quite agrees that carcinoma may, though rarely, supervene on chronic gastric ulcer, promiscuous excision would yield a greater mortality than the mortality from the superadded carcinoma; the likelihood of cancer is, moreover, greatly lessened if a gastro-jejunostomy is performed at the first operation. He concludes by saying that gastro-jejunostomy still remains the operation of choice in chronic duodenal ulcer and in the large proportion of cases of chronic gastric ulcer; it is only when complications have arisen that excision has to be added to the operative treatment.

THE DIAGNOSIS OF HYDRONEPHROSIS.

In *Surgery, Gynecology and Obstetrics* (November 1914) there is an article by Dr. Howard Kelly and Dr. Robert Lewis of Baltimore on a new method of diagnosis of the presence and extent of hydronephrosis. By their method the authors claim to be able to recognise all the stages of hydronephrosis from the moderate distension up to the large cystic, practically dead, kidney. The advantage of this method is that the condition can be early recognised and the exact form of the pelvis of kidney made out before operative procedures begin. The authors describe the methods they used in the routine examination of the patient, and they are interesting:—(1) Phenolphthalein test. One c.cm. of the drug was injected subcutaneously and the urine from each kidney collected. In the healthy kidney in one hour and a half 35 c.cm. of urine were collected with a phenolphthalein content 18·2. The hydronephrotic kidney showed 1 c.cm. urine collected and only a trace of drug secreted. (2) Eighty c.cm. sterile boric coloured by methylene blue were injected into the diseased pelvis of kidney through a ureteral catheter while a glass catheter was placed in the bladder to show any reflux. This gave the patient pain exactly similar to the hydronephrotic pain. It is to be noted that, though every facility was given for easy outlet of fluid, the pelvis of the kidney could contain this large quantity without great discomfort, behind a valvular opening to the ureter. (3) Ureteral catheter passed to just a little below the junction of pelvis and ureter. Ten c.cm. of a 5 per cent. emulsion of silver iodide and 50 c.cm. of a 1 per cent. emulsion were slowly injected. Catheter was kept in, clamped; the patient was X-rayed. The catheter was then freed and

some emulsion escaped and more was washed out. There was little pain as the result of injection. The resulting radiogram gives the excellent picture of the state of affairs in the pelvis of the kidney, its exact size and its position relative to the ureter, and very often demonstrates the valve-like opening from the one to the other.

The authors advocate this last procedure but are very careful to emphasise one point, viz. unless nephrectomy is to follow immediately, the injection of any foreign material into the renal pelvis is undesirable if not actually dangerous.

CONGENITAL PYLORIC STENOSIS.

Walton (*Ann. of Surg.*, September 1914) gives a résumé of the present medical and surgical views as regards this condition, and describes the extent to which they agree with his findings in a case which died seven months after operative interference, death being due to an intercurrent condition. With regard to etiology he brings prominently before our notice how 80 per cent. of cases are in males, and commonly it is the first-born that is affected. *Pathologically* he found, as usual, concentric hypertrophy of the muscular coat of the pylorus to the extent of half to three-quarters of an inch thick; no thickening or contraction, however, of the mucosa beneath. Three views are held as regards causation of this condition: (1) Congenital malformation; (2) spasm of the muscle, leading, through its long continuance, to secondary muscular hypertrophy; (3) inco-ordination between the movements of the stomach and pyloric walls. Hutchison, in discussing these three views, points out with regard to the first theory that the symptoms do not commence at birth; no history of congenital deformities was got in the family history and no other congenital defects seen in the patient, and these are thus all against it being a congenital defect. More points seem to favour the second view—that is, spasm; medical treatment to relieve spasm often cures the condition; the condition is more common when a change is made from maternal to artificial food, a factor which might easily cause spasm. Against this view we have to place the fact that no local condition is found, no ulcer which would cause the spasmodic contraction. As regards the third view, the authors say that little evidence can be brought forward either in support or against it. Dr. Thomson supports this last theory strongly, and Shattock classes into the same category as this, cardiospasm, idiopathic dilatation of the colon, and idiopathic dilatation of the bladder and ureters in children, all due to an inco-ordination of nerve impulses to the sphincters at the pylorus, in the rectum, and the internal sphincter of the bladder.

Treatment.—All are agreed that without treatment the condition is steadily progressive, but great discussion has arisen as to whether the treatment should be medical or surgical. The author discusses the views of many eminent physicians, as Hutchison, Heubner, etc., and

as regards the surgical treatment, the views of Scudder and others. Statistics of the different authors vary so much that one is at a loss to know which is exactly the best procedure; medical statistics range from 1.5 per cent. mortality by Heubner, to 78 per cent. mortality by Hutchison; surgical statistics show about 50 per cent. mortality. Dr. Thomson gives the mortality as 15 out of 23 cases, but he says in many operative treatment was sought only as a last resource, and thus this does not give a true percentage. Walton says that the series of successful cases following medical treatment cannot be overlooked, and a large number show a cure after treatment. On the other hand, it must be admitted that many such cases die under medical treatment alone, whereas surgical intervention has been very successful. It must also, as stated above, be remembered that surgical statistics appear to give bad results very often owing to the fact that the child is moribund before being seen by the surgeon. It would seem, then, that certain cases should be treated medically, while in others surgical intervention holds out the only hope of success. The difficulty still to solve is into what category does a certain specific case fall.

Four different methods of surgical treatment have been used—gastro-enterostomy, divulsion, pyloroplasty, and pylorotomy. The author is strongly in favour of gastro-enterostomy, and in this view he is supported by Scudder, who had six consecutive successful cases. One other important point is that in a child with a hypertrophied pylorus, gastro-enterostomy can be more rapidly performed than any of the other methods of treatment, and the rule applies here more than anywhere else that rapid manipulations inside the peritoneal cavity give the best results. After the operation, accessory parts of the treatment must be attended to, and these chiefly consist in getting into the system by the rectum, mouth, etc., as much fluid as quickly as possible, and peptonised milk should then be given in small quantities by the mouth.

F. E. J.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

G. H. MELVILLE DUNLOP, M.D., AND A. DINGWALL
FORDYCE, M.D.

SPASMOPHILIA.

ACCORDING to Reye (*Arch. of Ped.*, September 1914) spasmophilia is a symptom-complex depending on hyperirritability of the entire peripheral nervous system. The most characteristic symptoms of manifest spasmophilia are laryngospasm, convulsions, and tonic contractions of the extremities. At times there is retention of urine and difficulty in swallowing. On the part of the sympathetic nervous

system such symptoms as urticaria, oedema, vomiting and diarrhoea occur. The heart action is usually increased. Occasionally paræsthesias and pains in the extremities occur. The following signs demonstrate the condition of nervous hyperirritability and precede the characteristic symptoms:—

1. Chvostek's sign. This is elicited by pressing or tapping over the trunk of the facial nerve or its divisions, producing lively contractions of the muscles which they innervate.

2. Trousseau's sign is best produced by digital pressure in the occipital groove or by applying an elastic bandage and leaving it on for several minutes. It provokes a typical attack in that limb. This sign is usually considered pathognomonic.

3. Erb's phenomenon, demonstrating directly the increased irritability of the peripheral nervous system by means of the galvanic and faradic currents.

The spasmophilic diathesis usually remains latent. Spasmophilia occurs mainly between the third and twentieth month, and after the third year it resembles the tetany of adults more closely.

In general the theories regarding the etiology of spasmophilia may be reduced to the two following groups:—

1. Spasmophilic diathesis is due to calcium intoxication or to calcium deficiency.

2. Spasmophilia is due to parathyroid insufficiency, which may be the cause of a disturbance of the intermediary metabolism.

First Group.—According to Kassowitz the symptoms of spasmophilia are the nervous manifestations of rickets. Experience has shown that many symptoms of spasmophilia are dependent on the diet. By its means symptoms can be modified, controlled, and at times entirely suppressed. The kind of diet, therefore, forms an important factor in the pathogenesis of spasmophilic diathesis. However, we do not know the cause of this effect of the diet. At the present time it is presumed to be some disturbance in the intermediary metabolism. The symptoms of spasmophilia depend also on the quantity of the food: for the richer the diet the more pronounced the symptoms. They can often be entirely suppressed by cathartics, water, a tea diet or a complete fast. When this procedure is not effective even the return to the natural diet does not accomplish much.

Besides mother's milk, various artificial diets have an influence on spasmophilia. Cow's milk is most dangerous. In two of Finkelstein's cases sudden death occurred from spasm of the glottis when the babies had been put back on cow's milk. Sugar, butter and fats in general have no influence on spasmophilia. Finkelstein, therefore, thought that some constituent of the diet was the true cause of the nervous hyperirritability, but since severe spasmophilia cannot be influenced by the diet there must be other factors. Finkelstein studied the influence

of separate constituents of artificial feedings by adding casein of cow's milk, fat and sugar to the mother's milk of the spasmophilic child. However, he obtained no results. But when the whey of cow's milk was added, the irritability increased just as if the baby had again been put on cow's milk. Therefore, Finkelstein reached the conclusion that the underlying cause of tetany is a special form of disturbance of the intermediary metabolism. Since there is five times as much calcium in cow's milk as in mother's milk, he naturally thought of the influence of calcium. He tested this, but obtained no uniform results in the two cases that he worked with. Owing to the fact that phosphorus seems to exert a specific influence in spasmophilia, and also that spasmophilic diathesis is often coupled with rachitis, Finkelstein thought that there might be a derangement of phosphorus or calcium metabolism, the osseous and nervous system being both rich in phosphorus and calcium.

Stoelzner worked along the same line. He fed spasmophilic children with the different constituents of the whey of cow's milk in order to ascertain the causative agent. In his experiments he emptied the bowels and gave a milk-free diet in order to produce a normal electrical reaction. After the children had received some of the substances of the ash, he ascertained the number of milliampères necessary to produce a contraction of the flexors of the fingers on cathodal closing. He also tested for Trousseau's and Chvostek's sign. He gave lactate of iron, potassium acetate, sodium chlorate, sodium phosphate and magnesia without obtaining any increase in the electrical irritability. But when he gave a drachm of a 3 per cent. solution of calcium acetate every three hours he found an increase in the irritability. Of the 6 children suffering from spasmophilia 3 showed a definite increase. The other 3, however, gave less satisfactory results. In two non-spasmophilic children no increase of irritability occurred even when calcium was given. From these experiments Stoelzner concludes that the influence of cow's milk on spasmophilia lies in a calcium intoxication.

His theory of how this poisoning is brought about is rather interesting. He thinks that the absorbed calcium is not used by the organism, and is again excreted through the intestinal mucosa. When cow's milk is given much more calcium is taken up than would be the case if the infant obtained its natural food. Consequently increased demands are made on the intestinal mucosa. Those demands are even greater when the child is simultaneously suffering from rickets. In the normal child the greater part of the calcium is retained by the osseous system, but in rickets the whole of the absorbed calcium is again eliminated, and even some formed bone is broken down and its calcium excreted. Extraordinary demands are, therefore, made on the excretory functions of the intestinal mucosa; it finally becomes insufficient and there naturally results a calcium retention, which leads to intoxication of the organism with calcium.

Stoelzner's theory has been attacked by many authors, among them Weigert, von Pirquet, Bogen and Risel. There are a number of experiments that seem to prove that there is no calcium accumulation in spasmophilia.

In contrast to Stoelzner's theory Quest proved that an experimentally produced calcium accumulation does not provoke a greater irritability of the peripheral nerves. Weigert also found that the brain of a dog dying in spasms contained 0.125 per cent. calcium oxide, while that of the control animal had 0.158 per cent. of calcium oxide. The discussion between Stoelzner and Quest has not been decided up to the present time, for Stoelzner has been unable, even after he had fed dogs on a calcium-poor diet for twelve weeks, to demonstrate any difference in the irritability.

Thiemich thinks that in spasmophilia we are dealing with some change in metabolism the nature of which we know nothing. Since physiological experiments have shown that osmotically active salt solutions have an effect on the irritability of the peripheral nerves, it may be that we are dealing with a disturbance of the salt metabolism.

Concerning the part which the alkalies play in the production of the spasmophilic symptom-complex we know but little at present.

Second Group of Theories.—The second hypothesis of tetany and of spasmophilia depends upon the fact that, in the case of dogs, tetany may be produced experimentally by extirpation of the parathyroids. Even in the case of man, similar thyreo-prival tetany has been noticed after goitre extirpation when the parathyroids were not saved. Not all authors, however, agree on this subject. Erdheim's experiments on rats show that after complete parathyroidectomy tetany occurs, and that the animals usually die from inanition within two to five months. When the results are not so marked, it was usually found that accessory parathyroids had not been removed. Gley and Moussu, Vassale and Generali, also Welsh, Biedl, Chvostek, Pineles, Erdheim, Pfeiffer and Mayer attempted to show that experimental parathyroid tetany is identical with post-operative human tetany and also with spontaneous tetany in man. They maintain that tetany in man is referable to a disturbance in the function or to the non-function of the parathyroids. Pineles sees the proof of the identity especially in the correspondence of the clinical symptoms. He mentions fibrillary twitchings, typical of tetanic intention, tremors, spasms, mechanical and electrical hyper-irritability of the motor tract; Trousseau's phenomenon, trophic disturbances of the hair, teeth, and nails, opacities of the lens, etc. In both conditions severe attacks are followed by normal periods; Trousseau's sign comes and goes in experimental thyroid tetany just as in normal tetany; in both there may appear paralysis, contractures and intention tremors. There have also been observed symptoms that are analogous with the tetany of pregnancy.

Spasmophilia has in common with other forms of tetany occurring in man the most important symptom of galvanic hyperirritability as well as Chvostek and Trousseau's signs. The changes in muscular contractions also are the same in tetany and spasmophilia, as shown by Mann and Thiemich on the one hand and by Westphal, Bernhardt, Frankel-Hochwart, Hoffman and Pineles on the other. Pineles concludes that it has been proven by numerous experiments depending on the extirpation of the parathyroids and by clinical observations that the post-operative human tetany is caused by the removal of the parathyroids. He maintains that all kinds of human tetany, including spasmophilia, are identical in their nature. Since the clinical picture shows a complete correspondence between human and experimental tetany, he thinks that spasmophilia is due to insufficiency of the parathyroids.

Chvostek believes that no objection can be made to the argument of Pineles. Most pediatricians, however, are rather opposed to this theory.

Since milk diet is injurious in spasmophilia, but favourable in experimental tetany of dogs, Stoelzner concludes that spasmophilia and experimental tetany are entirely different conditions. Pineles feels that the pediatricians are too anxious to find things that prove the dependency of tetany on the diet.

Erdheim was the first to describe hæmorrhages into the parathyroids. He found them in 8 cases, 7 of which were between one and thirteen. In children the hæmorrhages were most recent, especially in the new-born that had died of asphyxia. The older the cases, the more absorption and healing had taken place. He thinks that they may all have been caused by asphyxia during birth.

Koenigstein also examined the parathyroids anatomically. He did not find any hæmorrhages or residues, but he thought that he found certain changes deviating from the normal.

However, the investigations of Auerbach showed that in the case of two-thirds of the children with normal irritability, traces of hæmorrhages can be demonstrated in the parathyroids. Therefore, the connection between the parathyreo-prival tetany and spasmophilia of infants cannot be considered as completely proven.

Kassowitz thinks that the explanation of human tetany necessitates the theory that special spasmodic centres are irritated by toxic substances of various origin not neutralised by the secretion of the parathyroids.

Investigations have shown that a connection of the ganglion cells of the spinal cord with the higher situated centres is not necessary in order to obtain the increased irritability in spasmophilia or tetany.

Koch found toxic bases in the urine of animals after parathyroidectomy. His experiments seem to show that digested proteins taken

into the body have toxic effects after the removal of the parathyroids. These effects he thinks are due to products of the intestinal and perhaps also parenteral digestion. Such products are normally placed in some cell molecule or stored up in some form. In the case of these animals they are free and act as toxins. In other animals where no feeding occurred, the symptoms probably followed the disintegration of the body protein. The pathologic condition would thus appear to be a failure on the part of the cells to build up their protein. He thinks the parathyroid action is concerned with anabolic processes closely related with the building up of the nucleins.

Summary.—From the foregoing it is evident that at present there is no unanimity of opinion. The majority of workers seem to favour the view that there is a disturbance in the intermediary salt—especially the calcium-metabolism, which may be due to an insufficient functioning of the parathyroids.

A. D. F.

DERMATOLOGY.

UNDER THE CHARGE OF

W. ALLAN JAMIESON, M.D., AND R. CRANSTON LOW, M.B.

THE CUTI-REACTION IN SYPHILIS, ETC.

SOME time ago reference was made to the luetin reaction in the diagnosis of syphilis. Luetin was introduced by Noguchi, and is an extract made from pure cultures of the spirochaete pallida. Since then Fischer has introduced another substance, "Pallidin," which is an extract made from the internal organs of congenital syphilitic cases. The pallidin is used in much the same way as old tuberculin in Pirquet's reaction. It is prepared usually from the lungs of cases of congenital syphilis with "pneumonia alba." It may also be prepared from any material which is rich in spirochaetes, *e.g.* lymph glands, suprarenals, syphilitic fetuses, primary sores, or secondary papules. The pallidin reaction shows as an erythematous inflammatory area around the point of inoculation. This reaction reaches its height within 36 to 48 hours, and in negative cases the point of inoculation remains completely reactionless. Klausner (*Archiv. f. Derm. und Syph.*, Bd. cxx., Heft 2, S. 444), who has used this test in 1800 cases, claims that it is specific for syphilis and is especially useful in the late stages of the disease, including the gummatous lesions, late congenital syphilis, and in the so-called para-syphilitic lesions. In these stages the reaction is positive in 90 to 100 per cent. of the cases. It has proved to be absolutely specific for gummata and late congenital cases, no positive results being obtained in over 1000 control cases. It is present in the majority of cases of malignant syphilis with early gummatous lesions where the Wassermann reaction is positive, and absent where the Wassermann reaction is negative. It is also useful in suspected syphilitic eye

affections. It is more reliable than the Wassermann reaction in cases of interstitial keratitis of syphilitic origin. The reaction is frequently absent in gummatous periostitis and in individuals with cachexia. Klausner claims that the pallidin reaction is on the whole more reliable than the Wassermann reaction in gummatous lesions and interstitial keratitis, and especially so in the latter condition. Treatment exercises less effect on the pallidin reaction than on the Wassermann, but the disappearance of a positive cuti-reaction has been often observed after thorough salvarsan and mercury treatment. After the pallidin reaction a case which previously gave a negative Wassermann may become positive. It is claimed that the cuti-reaction with pallidin is more often present than when luetin is used, and therefore that it is the most useful clinical method of diagnosing syphilis, and especially the late lesions of the disease. It is useful to supplement the Wassermann reaction, and a negative result is a great aid in excluding a diagnosis of syphilis. In late congenital syphilis the pallidin reaction is distinctly more reliable than the Wassermann reaction.

TUBERCULOSIS OF THE SKIN.

Up till the present, tuberculosis of the skin has been considered as due to infection with the human or bovine tubercle bacillus. To these two forms a third must now be added, namely, infection from birds. Numerous investigators have examined cases of skin tuberculosis, and in the great majority of cases the bacillus has been found to be of the human type. In order to distinguish the different types the only method is by animal inoculations. In doubtful cases, where it is important to make a correct diagnosis, if animal inoculations do not produce the lesions usually found by inoculation with material from human and bovine infections, then experiments should be tried with birds. Lipschutz (*Archiv. f. Derm.*, Bd. cxx., Heft 2, S. 387) describes such a case of lupus of nose, upper lip, etc., where positive results were obtained by inoculation of hens. The difference in the clinical forms of tuberculosis is sometimes due to the infection being due to a special type of organism. The ordinary lupus vulgaris is usually due to the human bacillus, whereas the warty form (tuberculosis cutis verrucosa), which is so often seen on the back of the hands, is practically always due to the bovine bacillus, and is a purely local inoculation through the skin. *Verruca necrogenica* (pathologist's wart) is in all probability due to a local infection with the human type of bacillus. The case of avian tuberculosis described by Lipschutz showed lesions which were more infiltrated than the usual lupus and an absence of the usual apple-jelly nodules. Small punched-out-looking ulcers were present with minute skin abscesses. In the lesions more numerous tubercle bacilli were found than is usually the case in lupus, and these bacilli were usually intracellular. What the exact source of infection in these

avian cases is, is difficult to say, but as lupus is just as frequently seen in country as in town people it is possible that tuberculous hens may be to blame.

SECONDARY LICHENOID ERUPTION IN RINGWORM.

Herscheimer and Köster (*Dermat. Zeitschr.*, July 1914) draw attention to a peculiar papular eruption which occasionally occurs in cases of ringworm. It has been observed in children who suffer from a deep ringworm of the scalp. The eruption has a follicular distribution, and consists of small papules, reddish or bluish-red in colour, some of which are flat, others of which have a sharp projecting point. The flat lesions are sometimes slightly shiny. The eruption may affect any part of the body or limbs, but is usually most marked about the lower part of the back. It comes out during the course of a deep ringworm either suddenly or gradually. The papules as a rule resemble those seen in lichen scrofulosum, but the eruption is sometimes very like that of pityriasis rosea or seborrhœic eczema. Fungus is not found in this generalised eruption, and it is still doubtful whether it is due to a blood infection with the fungus or whether it is an anaphylactic phenomenon due to the absorption of some toxic material from the ringworm lesion.

HERPES ZOSTER AFTER SALVARSAN.

It is well known that herpes zoster is liable to occur in patients taking arsenic. Oettinger (*Derm. Zeitschr.*, September 1914, S. 780) gives a résumé of all the cases which have developed herpes after the administration of salvarsan. The herpes may appear directly after the administration of the salvarsan, or it may be delayed till some time later. It may occur after the first injection, or only after repeated doses. When it occurs after the first injection, after subsequent injections a fresh eruption of zoster may develop on another area. The dose of salvarsan which is given does not seem to make any difference, the herpes appearing just as frequently after small doses as large. The method of administration of the salvarsan also has no influence. The herpes eruption may affect any part of the body, face, or limbs, and has the usual appearances and distribution.

CALCIUM LACTATE IN THE TREATMENT OF SKIN DISEASES.

White (*Journ. Cutaneous Dis.*, October 1914) gives his experiences with calcium lactate over a period of seven years. He gave it in the following form:—

R	Calcii lactat	gr. 160
	Tinct. capsiei	℥ 8
	Aq. chloroformi	ʒ 20

Sig.—Two tablespoonfuls in water before meals.

In addition to the administration of calcium lactate, patients were asked to partake as freely as possible of food rich in calcium such as Swiss cheese, butter, spinach, yolk of egg, milk, beans, peas, etc. They were also urged to avoid raw fruits and all acid foods.

In cases of chronic urticaria the results were very good, the great majority showing very great improvement. In cases of erythema multiforme about one half showed decided improvement under calcium whilst the other half of the cases ran the usual course. Cases of chilblain did very well. Half the cases were cured in a very short time; one quarter improved greatly, and the other quarter were not benefited. The results were also very satisfactory in hyperidrosis of the palms and soles, which is always a difficult condition to cure. In purpura the results were not so good, the calcium failing more often than helping. Altogether fifty cases were treated with calcium. Many of the patients were severely affected, and had had numerous forms of treatment previously. The author recommends the drug as of distinct service, and one which should always be tried in obstinate cases of urticaria, erythema multiforme, pemphigus, hyperidrosis, and possibly purpura.

PEMPHIGUS NEONATORUM.

Cole and Rich (*Journ. Amer. Med. Assoc.*, 3rd October 1914) report an epidemic of eight or possibly nine cases of pemphigus neonatorum in a maternity hospital. The staphylococcus aureus was isolated in pure culture in all cases in which unbroken vesicles could be found. In one case a bacteriemia developed, resulting in death on the twelfth day of the disease. In the other cases the use of an autogenous vaccine seemed to give prompt results when other measures failed. The vaccine was given in doses of 5,000,000 every two or three days. Clinically the cases showed the usual vesicles, pustules, and bullae. Despite strict isolation, precautions, and fumigation of separate rooms, the disease spread and it was found necessary to close the institution for a thorough disinfection.

The epidemic started from a case of typical pemphigus neonatorum which later changed into the clinical picture of dermatitis exfoliativa neonatorum (Ritter's disease), and the authors believe that, as in both conditions the staphylococcus has been found to be present, no distinction should be drawn between the two diseases. Ritter's disease is only a severer form of pemphigus neonatorum. Bullous impetigo contagiosa should be sharply differentiated, because it is due to the streptococcus. The authors also consider that pemphigus neonatorum should be placed among the notifiable diseases because of its severe epidemic characteristics and high mortality (25 to 50 per cent.). Because of the striking results obtained in their epidemic they further recommend the use of an autogenous vaccine in all cases of pemphigus neonatorum.

PFANNENSTIEL'S METHOD FOR TREATING LUPUS VULGARIS.

The method of Pfannenstiel, the administration of sodium iodide internally and peroxide of hydrogen locally, has been shown to be very useful in tuberculosis of mucous membranes, but in lupus of the skin the difficulty has been that it was impossible to get the hydrogen peroxide through the skin into the tissues. This difficulty has been to a great extent got over by Schramck (*Wien. klin. Wochenschr.*, 22nd January 1914), who gives sodium iodide internally and locally applies radium. Radium rays split up water into hydrogen and hydrogen peroxide, so that if a lesion is exposed to radium the water in the lesion is broken up, setting free hydrogen peroxide, which reacts on the sodium iodide circulating in the part, thus setting free iodine. The radium was filtered through guttapercha and a silver filter which cuts off the very soft α - and β -rays. An exposure of from one to two hours was given. Two or three days later an inflammatory reaction results, which may in some cases even go on to necrosis. At intervals of three weeks or so the application is repeated. Schramck claims to have obtained very encouraging results, the disease healing with a scar which is smooth and fine and without any tendency to keloid-like hypertrophy.

R. C. L.

LARYNGOLOGY, OTOTOLOGY, AND RHINOLOGY.

UNDER THE CHARGE OF

A. LOGAN TURNER, F.R.C.S., J. S. FRASER, F.R.C.S., AND
W. G. PORTER, F.R.C.S.

NON-SUPPURATIVE DISEASES OF THE INNER EAR.

(Continued.)

VI. *Circulatory Affections: Arteriosclerosis.*—*Cerebral deafness* due to apoplexy has been described by Boeninghaus. Senile deafness is usually attributed to arteriosclerotic changes. Stein has found that inner ear deafness may be due to arteriosclerosis, even in young people. In such cases anæmia leads to changes in the inner ear. In a case of arteriosclerotic deafness Alexander found that the cochlea alone was diseased and showed atrophy of Corti's organ—first of the hair cells and then the supporting cells, ending in complete atrophy of the acoustic papilla. The stria vascularis, spiral ligament, spiral ganglion, and cochlear nerve all participated in the atrophy. Arteriosclerotic changes were found in the arteries of the inner ear. Mannasse and Bruehl have confirmed this observation, while Alagna found the vestibular ganglion and nerve degenerated in an old man. Pause found parenchymatous neuritis of the acoustic nerve with secondary degeneration of the spiral ganglion and Corti's organ in the lower coils in a man of 61 years.

The labyrinth changes in arteriosclerosis are almost always confined to the cochlear apparatus.

Symptoms.—Tinnitus occurs early in arteriosclerotic affections of the ear, and a little later the hearing power diminishes. The deafness is slow in onset, but intercurrent disease or accidents may bring on an "attack of deafness." Giddiness, if present, is usually cerebral, but may be due to neuritic changes. Unpleasant sensations or even pain in the ear may occur in arteriosclerosis, and are probably due to circulatory disturbance. Functional examination reveals inner ear deafness, *i.e.* diminished bone-conduction; air-conduction better than bone-conduction; tuning-fork on the vertex heard in the better ear; marked lowering of the upper tone limit; retention of hearing for the low tones; loss of hearing for the watch by bone-conduction. Physical examination reveals a raised blood-pressure, rigid arteries, accentuated second sound, etc. Arteriosclerotic ear disease may be a part of disease of the cerebral vessels and is then associated with headache, loss of memory and brain fag.

Treatment is useless in advanced cases, but, in the early stages, a careful dietary may retard the process. Stein recommends diuretin, 0.5 gr. four times daily, for giddiness, noises, and unpleasant feelings. Theobromin and amyl nitrite have been recommended by Urbantschitch. Local treatment is useless, except galvanism, with the anode applied to the affected ear.

VII. *Diseases of the Central and Peripheral Nervous System.*—In *hydrocephalus* we have changes in the labyrinth due to the raised intracranial pressure, *e.g.* dilatation of the cochlear aqueduct.

In cases of *tumour* of the eighth nerve we find extensive destruction of the nerve and membranous labyrinth. Intact nerve bundles are, however, often found in the tumour. Clinically, one finds complete loss of function of the inner ear, with a normal middle ear. There are also signs of brain pressure and of labyrinthine and cerebellar giddiness. In such cases, not only is the caloric reaction of the affected ear lost, but the electrical reaction is also absent. (In cases of labyrinthitis the electrical reaction is retained, as the nerve is healthy (Abstractor).)

Treatment.—The cerebellum is exposed by operation and an attempt made to remove the growth. Ruttin and Kuemmel have suggested a translabyrinthine route. *Tumours of the dura mater* (sarcoma) in the region of the internal meatus may cause changes in the eighth nerve and complete atrophy of the cochlea. The vestibular nerve is more resistant than the cochlear, but not so resistant as the facial (portio dura).

Hysteria.—The characteristic sign of hysterical affection of the cochlea is fractional perception of the tuning-fork. Hysterical patients may also complain of severe disturbance of balancing, but they have no spontaneous nystagmus, and if they tend to fall, the direction of the

fall does not alter when the position of the head is changed, as in cases of labyrinthitis. Alexander states that there is such a thing as labyrinthine neurasthenia, *e.g.* cases of chronic middle ear suppuration may have only slight clinical signs of labyrinth trouble and yet complain of severe attacks of giddiness and disturbance of balancing. Operation should be avoided in these cases. Alexander does not believe in operation on the labyrinth, or section of the eighth nerve, for tinnitus or vestibular giddiness of non-suppurative origin; the danger to the patient is too great, and the tinnitus may continue even after a successful operation. Cases of protracted giddiness are not of pure labyrinthine origin, because after injury of the labyrinth giddiness soon gets less. In severe and protracted cases there is always a neurasthenic element, which should receive appropriate treatment.

VIII. *Toxic Diseases.*—Kirchner and Wittmaeck have proved experimentally that quinine alters the nerve ganglion apparatus and thus produces secondary changes in Corti's organ. Similar observations have been made with regard to salicylates and arsenic. Alcohol and nicotine do not affect the labyrinth directly, but injure it by causing arteriosclerosis. Marx has observed atrophy of sensory epithelium in the vestibule and cochlea as a result of radium. The changes occurred about six months after the experimental exposure to radium.

IX. *Infections*—(a) *Acute.*—Infectious diseases may cause acute neuritis, which leads to more or less permanent changes in the nerve structures—a condition which rarely clears up. Mumps is the most common cause, but this group also includes typhoid fever, influenza, erysipelas, acute rheumatism, diphtheria, scarlet fever, measles, pertussis, pneumonia, and cerebro-spinal meningitis. All these diseases may cause acute neuritis, though many of them much more frequently give rise to purulent labyrinthitis following otitis media. Moos has found hæmorrhages in the labyrinth after whooping-cough, while Wittmaeck found neuritis in scarlet fever and nerve atrophy after typhoid. In *mumps* the neuro-labyrinthitis may affect the cochlear or vestibular nerve or the corresponding parts of the labyrinth; the facial nerve may also be involved. The condition is usually unilateral. In some cases the disease is a serous labyrinthitis, and in others an inflammatory neuritis going on to atrophy. The symptoms are like those of diffuse serous or circumscribed labyrinthitis, and only rarely resemble those of diffuse purulent labyrinthitis. In some cases a complete cure results, while in others the static labyrinth recovers, but the cochlea remains functionless. As a rule facial paralysis, if present, clears up completely.

Treatment.—Rest in bed and the application of an ice-bag to the head. If giddiness be present the room should be darkened and galvanism should be employed to produce a nystagmus in an opposite direction to the pathological one present in the case. If the symptoms be severe, narcotics may be given. Later on, when all vestibular

symptoms have disappeared, hot air or Turkish baths may be recommended. Alexander has *not* obtained good results from the use of pilocarpine or fibrolysin.

Typhoid Fever.—Mannasse has found chronic inflammatory changes in the membranous labyrinth and in the labyrinth capsule after typhoid fever.

Symptoms.—Labyrinthine deafness, tinnitus, vestibular giddiness, and disturbance of balancing. The neuritic character of the pathological changes in typhoid fever are proved by the use of galvanism. If one applies the anode to the ear and the cathode to some indifferent part, and closes the current, the noises get less or disappear, whereas with the cathode applied to the ear closure of the current increases the noises.

Influenzal neuritis of the acoustic nerve is often combined with neuritis of the trigeminal, abducens, or facial nerves; Biehl, Hagener, Lannois, and Wittmaack have recorded cases of neuro-labyrinthitis after influenza. Functional examination shows lowering of the upper tone limit, deafness, spontaneous nystagmus, and disturbance of balancing; the deafness may be complete.

In *erysipelas* acute serous labyrinthitis may occur. When the attack is over the hearing returns to normal or is only slightly reduced.

In *acute rheumatism* severe deafness is exceptional, but neuritis due to the use of salicylates is common.

(b) *Chronic Infectious Diseases—Tuberculosis.*—Wittmaack has experimentally produced degenerative neuritis by infecting the ear with tuberculosis. Secondary degenerative atrophy of the nerve ganglion and membranous labyrinth may be due to chronic tubercular changes in the middle ear, though they are rare. Labyrinth disease in tuberculosis of the ear is usually due to purulent tubercular labyrinthitis.

Syphilis.—The clinical signs of congenital syphilis (Hutchinson's triad) are too well known to require description, but our knowledge of the exact pathology of acquired or inherited syphilitic deafness is still very meagre. In many cases middle ear affection is present—catarrhal, suppurative, or adhesive. The pathology of the inner ear conditions has not yet been ascertained, but it is probable that a neuro-labyrinthitis is present in most cases. In congenital syphilitic infants meningitis—localised to the region of the internal meatus—has been found by Meyer and others.

Treatment.—There is still considerable dispute with regard to the use of salvarsan in syphilitic ear affections. Some hold that this drug acts on the auditory nerve in the same way that atoxyl acts on the optic nerve. There seems little doubt that "neuro-recurrences" in the auditory nerve have been more frequent after the use of salvarsan than after the administration of mercury, but it is doubtful as to whether

these are due to the salvarsan or to syphilis. Gerber agrees with Politzer that the eighth nerve is remarkably vulnerable.

Before the administration of "606," a general examination of the patient is of great importance—the condition of the heart, fundus oculi, ear, and urine being ascertained. Atheroma, aneurysm, heart disease, nephritis, or disease of the ear are relative contra-indications to the use of "606." If any ear affection be present, it is best to begin with mercury and iodide, or with small doses of salvarsan. Recent reports have shown that when mercury is combined with salvarsan, there are almost no cases of neuro-recurrence.

With regard to the treatment of inner ear affections by means of "606," good results are reported in *recent* cases due to acquired syphilis by Benario, Westler, Haïke, and Wechseltmann. Siebenmann has obtained good results from salvarsan combined with mercury. In old cases of syphilis—especially of congenital syphilis—in which there has been a *recent onset* of Ménière's symptoms, good results have been reported by Siebenmann, Krumbein, and others. In old cases of syphilis with inner ear affection of *long standing*, very little result has been obtained as a rule from the administration of salvarsan, though in some cases the giddiness has improved. Botey says that after three months a labyrinthine affection due to syphilis is incurable, but Gerber holds that Botey is too pessimistic.

With regard to the question of injury to the ear in cases of syphilis of other parts treated with salvarsan, Gerber indicates that in his opinion many cases of neuro-recurrence are due to faults in dosage (neurotrope) or to faults in technique (intramuscular injection or water error). Ehrlich, in his experiments on animals, never found any bad results in the ear from the administration of salvarsan, and concluded that the inner ear affection was due to syphilitic meningitis. This is supported by the results of lumbar puncture (finding of meningitis) in many cases of neuro-recurrence. In the ear the spirochæte foci resist sterilisation on account of the poor vascular supply; the nerves, in their narrow bony canals, may be injured by the reactive swelling (Alexander).

In some cases the vestibular nerve may be alone affected after an injection of salvarsan, just as the abductor fibres in the recurrent laryngeal nerve are picked out in cases of pressure and toxæmia.

Alexander holds that *salvarsan alone* is contra-indicated, even if the auditory apparatus be intact, in the early stage of syphilis, and also during the period of the skin eruption, and, in the later stages of the disease, if a syphilitic labyrinth infection be present. In all these cases there is danger that salvarsan may bring on or make worse a labyrinth affection. Alexander states that mercury or mercury and salvarsan are to be recommended, although he admits the good results of salvarsan alone in some cases.

Lieven says that since the salvarsan era more cases of acoustic nerve infection have been seen than formerly. He holds that this is due to insufficient salvarsan treatment, as the cases affected by deafness were usually those in which a single dose of "606" was given in an early stage, without any other therapy. Such doses are only provocatory, and often change a negative into a positive Wassermann and produce the feared "neuro-recurrence." If the patient refuse repeated salvarsan injections, it is better to withhold it altogether and to trust to mercury alone. If this line is adopted, the onset of neuro-recurrence will become as rare as it was when mercury was the only remedy. Segura said he had had opportunities of observing several cases of labyrinthine complications after the use of salvarsan. Among these was a married couple. Two months after injection both developed grave symptoms of labyrinthine disease—vertigo, vomiting, deafness, and noises. The husband became almost insane and the wife had to be kept in bed for a fortnight on account of vomiting and dizziness. The husband's hearing was almost completely restored, but the wife became all but entirely deaf. Bruehl agreed with Alexander that since salvarsan treatment labyrinth affection had been much more frequent than formerly. In his experience an improvement in hearing in such cases, after further injections of salvarsan, was not to be expected. Bruehl holds that the injection may "mobilise" the disease or the case may be one of toxic neuritis due to the injection. In any case, the unfortunate result for the patient is the same. Bruehl had never seen good results from "606" in severe hereditary or acquired cases of long standing, while in recent cases he obtained these results with mercury and iodide. The greatest care was necessary in the treatment of labyrinth syphilis with salvarsan. Mackenzie said that in the skin a Herxheimer reaction was transitory and left no ill effects, but the occurrence of a Herxheimer swelling in a delicate nerve trunk, already slightly damaged by disease, was obviously liable to be followed by permanent and serious nerve atrophy. De Stella has abandoned salvarsan in favour of neo-salvarsan (914).

(b) *Secondary Non-Purulent Diseases of the Labyrinth.*

I. This variety of labyrinth disease may occur during the course of *acute* otitis media. Bezold points out that lowering of the upper tone limit in acute otitis indicates concomitant affection of the inner ear (serous labyrinthitis), and is followed by subsequent severe deafness.

II. In *chronic* suppurative otitis media concomitant affection of the inner ear is frequent, but its mode of occurrence is not thoroughly known. In some cases new connective tissue forms in the niche of the round window and in the scala tympani just above it. This leads to fixation of the basilar membrane and loss of function of that part of the cochlea. Corti's organ in this region atrophies from disuse along

with the corresponding parts of the cochlear nerve and ganglion. Deafness in chronic suppurative otitis media is occasionally due to primary neuritis. The degenerative changes in these cases usually affect the whole labyrinth, but occasionally the cochlear function is lost while the vestibular is retained (Ruttin). Clinically, these cases of secondary labyrinth degeneration due to chronic middle ear suppuration are progressive, and may end in complete deafness. The pathological changes are the same as those in arteriosclerosis.

Treatment.—It is important to cure the suppurative otitis media as soon as possible, in order to bring the labyrinth degeneration to an end. Brown has, however, described post-operative labyrinth degeneration.

III. *Otosclerosis.*—Hammerschlag holds that hereditary degenerative deafness, progressive labyrinthine deafness, and otosclerosis are different forms of a single disease. According to Manasse, one can only make a certain diagnosis of otosclerosis by microscopic examination after death. There are cases of otosclerosis which do not lead to stapes ankylosis. In such cases one cannot diagnose otosclerosis unless the flamingo-red tinge of the promontory can be seen through the drum-head (Schwartzé symptom). Most otologists, however, still hold to Bezold's triad—lengthened bone-conduction, negative Rinné test (bone-conduction better than air-conduction), and loss of low tones—as the clinical test for otosclerosis. With regard to the origin of the bone disease, Habermann tends to the view that the disease begins in the periosteal layer of the mucosa. Politzer holds that the disease is primary in the labyrinth capsule.

Concomitant degeneration of the cochlea and nerve may be due to the bony change reaching the endosteum.

We have only recently recognised the relationship between otosclerosis and inner ear affections. Foci of *ostitis vasculosa*—the early stage of otosclerosis—have been found in deaf-mutes and in other inner ear cases, such as cretinic deafness. Functional examination of the ear in cases of otosclerosis has shown the surprising frequency of changes in the inner ear. In some cases of otosclerosis, labyrinth changes appear to be primary, so that we must include otosclerosis among the hereditary degenerative diseases of the ear. These patients suffer from harassing tinnitus, progressive deafness, and paraësis. Functional examination reveals mixed middle and inner ear deafness. The labyrinth changes in advanced otosclerosis are usually secondary, but, on the other hand, in a few cases the nerve changes may precede those on the bone.

Treatment.—Von Eicken thinks that phosphorus delays, if it cannot cure, the process. Siebenmann and Beck (New York) have found that injections of adrenalin may improve the tinnitus. Beck has used gland extracts—spleen, thymus, etc.; Denker, hypophysis and pituitarin tablets. Ovarian or spermin tablets have also been tried.

NEW BOOKS.

Gonorrhœa and its Complications in the Male and Female. By DAVID WATSON, M.B., C.M., Surgeon to the Glasgow Lock Hospital. Pp. 367. London: Henry Kimpton. 1914. 15s. net.

As the author of this work truly points out, not only is the treatment of gonorrhœa seldom adequate, but the disease, in British medical literature at any rate, has not received the attention it deserves. It is, therefore, with pleasure that we are able, after a careful perusal of Dr. Watson's book, to congratulate him heartily on having made a very notable and successful contribution to this branch of venereal disease. Moreover, our satisfaction is certainly not lessened by the fact that the author hails from North of the Tweed.

The whole subject of gonorrhœa in the male and in the female is dealt with in a comprehensive manner without being encyclopedic. Indeed the author makes a point, especially in the question of treatment, of only going into detail with regard to matters that he has had personal experience of. Sixty-three excellent diagrams, photographs, photomicrographs, and nine coloured plates help materially to elucidate the letterpress, which is printed in large type throughout.

We are glad to find that the history of gonorrhœa is only briefly considered; in fact it may be said that no "padding" is to be found in the book. On the other hand, the subject of chronic gonococcal urethritis is dealt with at length, and is one of the best sections in the work. We would have liked to have found more consideration given to the important subject of non-gonorrhœal urethritis, and trust this will be attended to in subsequent editions (which we are sure will be called for). The same remark applies to the section on vaccines. The author considers that "vaccine therapy, as at present practised, is likely to do more harm than good. . . . Personally, I am convinced of the specific power of gonococcus vaccine to modify the disease one way or the other, but I am equally convinced that we have not yet worked out the data necessary to enable us to use vaccine with sufficient control over its therapeutic action to justify its indiscriminate employment." While these remarks, no doubt, explain the scanty reference made to vaccine therapy in gonorrhœa, we think the author is wrong in not going more fully into the subject, more especially so since in the chapter on gonorrhœal rheumatism the following occurs: "It is in gonococcal rheumatism that the most definite and satisfactory results have been reported from the use of gonococcus vaccines."

In the next edition, also, we hope to see a more detailed scheme given of the examination of a patient suffering from a urethral discharge.

With these few criticisms we end as we began in heartily recom-

mending the book to anyone interested in the subject of gonorrhœa. It is written in excellent English, and all the latest methods, such, for example, as the use of atropine and the application of local heat to the interior of the urethra, are not forgotten.

Practical Bandaging. By ELDRIDGE L. ELIASON, A B., M.D. Pp. xiv. + 124. With 155 Illustrations. Philadelphia: J. B. Lippincott Co. 1914. Price 6s. net.

IN this book the student will find, within a very reasonable bulk and presented in a convenient form, clear and precise descriptions of all the classical bandages, together with many additions and modifications of a practical nature. Such accessories as adhesive and plaster dressings are also fully treated. The work is freely illustrated by diagrams and photographs, which are admirably carried out.

The author professedly deals only with the application of the various bandages, and not with the indications for their use, but even with this omission the book should prove of considerable value to the student.

The Infant: Nutrition and Management. By ERIC PRITCHARD. Pp. 265. London: Edward Arnold. 1914. Price 3s. 6d. net.

THIS is an excellent little book. It deals in a simple and comprehensive way with the medical care of infancy, and in some respects treats of the subject from novel aspects. As would only be expected from the author there is much in it respecting schools for mothers and infant consultation centres which is both interesting and instructive.

A Brief Review of the Work of Donders. By ERNEST CLARKE, M.D., B.S., F.R.C.S. Pp. viii. + 110. With 19 Illustrations. London: Baillière, Tindall & Cox. 1914.

DR. CLARKE gives an account of the work on the refraction of the eye carried out by Donders fifty years ago, and as a tribute to the genius of the great Dutch oculist the book is interesting and readable. The author appends a brief résumé of the progress made since the time of Donders, including some work of his own upon the accommodation. Many of the conclusions he reaches seem based upon rather slender evidence, and in this respect contrast markedly with the incontrovertible statements of the great man to whose undying memory his book is dedicated.

Human Derelicts. Edited by T. N. KELYNACK, M.D. Pp. xxii. + 341. London: Charles H. Kelly. 1914. Price 5s. net.

IN a foreword to this book Sir Thomas Clouston states that there are more than a million derelicts in Great Britain, all of whom are a burden on their relatives or the public. The book itself contains

seventeen essays by different authorities on the various classes of derelicts. Dr. Claye Shaw writes on "Lunatics"; Dr. Langdon Down on "The Feeble-Minded"; Dr. Devon and Dr. Quinton on "Criminals"; Dr. Helen Wilson on "The Prostitute"; Dr. Dighton on "The Deaf"; and Dr. Bickerton on "The Blind." Dr. J. W. Ballantyne contributes an article on "Prenatal Influences," and Dr. Saleeby one on "Eugenics." These essays are described as "studies for teachers of religion and social workers." To the latter, at least, we can cordially commend them as interesting, useful, and authoritative. One or two of the contributions might have been better if the writers had aimed more definitely at imparting information of a kind likely to be practically useful to the readers for whom the collection is intended; most have the fault—not altogether a bad one—of being too short. Each essay is followed by a useful list of references to books for further study. We think the editor would have been well advised to have edited these lists so as to have prevented the repetition of several well-known books two or three times, and to have secured the inclusion of some standard works which are not mentioned by anyone. We ought to add that quite a number of the articles, though written for laymen, may be read by doctors with both pleasure and profit.

The House-Fly: Its Structure, Habits, Development, Relation to Disease, and Control. By C. GORDON HEWITT, D.Sc. Pp. xv. + 382. With 105 Illustrations. Cambridge: At the University Press. 1914. Price 15s. net.

A GOOD deal has now been written about the house-fly, but there is room for Dr. Hewitt's treatise, which brings together in a masterly manner all the information available regarding this insect. But the book is no compilation. Dr. Hewitt is well known for the valuable work he has done, both in England and in Canada, in investigating the structure and habits of *musca domestica*, and its relation to the spread of disease. Although founded upon his important memoir in the *Quart. Journ. of Micro. Science* (1907-09), this book is a new work, and is indispensable to all who have to do with public health.

The first three parts are devoted to the anatomy, bionomics, etc., of the fly, both adult and in its earlier stages. The subject is presented in a clear and interesting manner, and with numerous illustrations, mostly original. Part IV. describes other species of flies frequenting houses.

Part V. deals with the relation of house-flies to disease. The evidence is now complete that the house-fly is a very potent factor in the dissemination of disease; not by carrying pathogenic micro-organisms as the mosquito does, but by the conveyance of disease germs carried on the appendages or other exterior parts, or ingested into the food canal. The chapters proving this (*e.g.* in typhoid fever)

are full of striking facts. Part VI. deals with control measures. The volume is beautifully got up. There is a good index, and a bibliography of 37 pages.

A Text-Book for Midwives. By JOHN S. FAIRBAIRN, F.R.C.P., F.R.C.S., Obstetric Physician, St. Thomas' Hospital, etc. Pp. 317. 107 Illustrations (5 in Colour). London: Henry Frowde and Hodder & Stoughton. 1914. Price 10s. 6d. net.

EVERYONE engaged in the teaching of maternity nurses and midwives will welcome this most comprehensive and well-designed volume. In addition to the qualifications necessary for handling such a subject—a thorough knowledge of medical science in general, and practical midwifery in particular—Dr. Fairbairn possesses also a keen appreciation of the needs and aspirations of the more advanced school of practising midwives which has enabled him to write a signally successful book.

Every teacher has to face the difficulty of want of knowledge of essential physiological principles among many of his pupils. To meet this deficiency Dr. Fairbairn has written exceedingly attractive and lucid chapters on anatomy, physiology, and bacteriology as the introduction to his book. Another original feature is that he quotes in the text the various rules of the C. M. B. wherever they apply, instead of reprinting them *en bloc* at the end of the volume. This plan will certainly train the pupil-midwife to reason out things intelligently for herself, instead of committing them to memory in parrot-like fashion.

The common forms of lingering labour are clearly described. To be able to distinguish between them is perhaps the most important function of the midwife: it is the true foundation of sound practice in midwifery. No greater practical error can be made than mistaking tonic contraction of the uterus for secondary uterine inertia, and *vice versa*, since the treatment is diametrically opposite. The first and foremost duty of the well-trained midwife is to know when to send for skilled assistance.

There are a large number of exceptionally useful figures and diagrams, and the index leaves nothing to be desired. In every respect we regard this book as a distinct advance on those of its kind, and it will doubtless meet with the success that its original style and completeness deserve. It will prove of the utmost value, also, to the conscientious teacher of midwifery nurses.

Manual of Obstetrics. By EDWARD P. DAVIES, A.M., M.D., Professor of Obstetrics in the Jefferson Medical College, Philadelphia. Pp. 452. With 171 Illustrations. Philadelphia and London: W. B. Saunders Co. 1914.

THIS book is intended to give a concise account of the modern theory and practice of obstetrics to the student and practitioner who has not

the time to keep himself up to date in these matters by the constant study of the medical journals of the world.

In its arrangement the book departs from the customary usage. The opening chapter on the anatomy of the normal pelvis is followed by one on the anatomy of the abnormal pelvis. For the practitioner this may be all right, but the ordinary student usually finds the study of pelvic abnormalities so dry and difficult that he is likely to be discouraged by these opening chapters!

The physiology of impregnation, including the embedding of the ovum, is disposed of in one paragraph, no mention being made of the method by which the ovum embeds itself. This renders it impossible for the author to give a really logical or helpful description of the development and essential structure of the placenta, and accordingly these matters are to a great extent avoided.

For the practical chapters of the book we have nothing but praise. All the usual methods of treatment and the obstetric operations are lucidly described. Perhaps the author might with advantage have expressed his own preference in regard to the choice of operation in circumstances where there is an alternative.

The section on foetal pathology is unusually full for a book of the size, and contains valuable practical hints on the treatment of birth injuries.

The illustrations are for the most part familiar, but are clearly drawn and well chosen.

Nutrition: A Guide to Food and Dieting. By CHARLES E. SOHN, F.I.C., F.C.S. Pp. xv. + 256. With 7 Illustrations. London: Henry Kimpton. 1914. Price 3s. 6d. net.

THIS small volume treats of a good many matters relating to human food. Introductory chapters deal with the digestive system, its anatomy and physiology, and with the food requirements of healthy adults and children; they are too condensed to give a satisfactory presentation of these subjects. The remaining and more important portion of the book takes up the staple human foods in detail, discussing the salient characters, chemical, structural and economical, of each. When one considers the great number and variety of articles of food, the treatment of each, though brief, is concise and practical; and the whole is a useful collection of miscellaneous information on the subject of food. Dieting, which is included in the sub-title, occupies a very small place in the text. Dietaries in health are dealt with in a meagre and too theoretical manner, and beyond a very short and imperfect discussion of food in gout, the subject of dieting in disease is almost totally neglected.

The "Arneth" Count. By W. E. COOKE, M.B., M.R.C.P.E., D.P.H.
Pp. 52. Glasgow: Gilmour & Lawrence, Ltd. 1914.

As a result of his personal observations the author strongly recommends the "Arneth" count of the leucocytes as a helpful factor in the study of certain diseases. Its chief value is in pulmonary tuberculosis, and he considers that, as a guide to prognosis and treatment, it surpasses any method yet employed.

X-Rays: An Introduction to the Study of Röntgen Rays. By G. W. C. KAYE, B.A., D.Sc. Pp. xix. + 252. With 97 Illustrations.
London: Longmans, Green & Co. 1914. Price 5s. net.

OF the many books written on this subject, Dr. Kaye's contribution is a valuable one, and will commend itself to every student interested in the present-day methods and apparatus in a realm of science, which has proved of inestimable service both to the physician and surgeon. The chapters dealing with an X-ray bulb, the characteristics of X-rays, and the therapeutic use of X-rays, are most helpful.

The book is lucidly written, and the author is to be congratulated on the skill with which he has put together the outstanding features in a study which often is too technical to be understood and appreciated.

Operative Surgery of the Nose, Throat, and Ear. By HANAU W. LOEB, A.M., M.D. Vol. I. Pp. xxi. + 390. With 409 Illustrations.
London: Henry Kimpton; Glasgow: Alexander Stenhouse.
1914. Price, 2 vols., £2, 10s. net.

FOR some time past the need for an advanced text-book upon the surgery of the ear, nose, and throat has been felt. This want has been admirably filled by the above book. The surgeon is here provided with a mine of useful knowledge, such as could only otherwise be obtained by extensive personal experience combined with very wide reading.

The book commences with a detailed description of the anatomy of the nose, pharynx, larynx, front of the neck, and ear, and is very well illustrated by original drawings. One of the principal features of this volume is an up-to-date account of endoscopy methods, in which considerable attention is paid to practical detail, so that an operator of no great experience may know what difficulties to expect and be prepared to overcome them. It seems a pity in a book of such a high standard that more had not been written about suspension laryngoscopy, but as it is such a recent development of endoscopy this is pardonable. A very large section of the book is devoted to plastic surgery of the face. We are somewhat surprised that there is no mention of intratracheal insufflation of ether in operations on the throat, especially in excision of the larynx.

In conclusion, the book is one which will be of the greatest possible service to the great majority of ear, nose, and throat surgeons, and, as far as the first volume goes, it is the most complete work of the kind that has yet appeared in English. We look forward with great interest to the appearance of the second volume.

Les caractères médicaux dans l'écriture chinoise. By Dr. LUCIEN-GRAUX, Laureat de l'Institut. Pp. 276. Paris: A. Maloine. 1914. Price 4 francs.

THIS is a study of the Chinese characters used to represent diseases and medical terms generally. All are derived from one root (No. 104) out of the series of 214 fundamental characters. This root, pronounced Nî in Pekinese, has received several interpretations, but Dr. Lucien-Graux gives reasons for believing that it was originally compounded from those for a man and a plank or board, hence a man lying on bed—sickness. By adding to this root other signs, diseases are signified; thus nî plus the sign for growth means a swelling—add the sign for wind, and you have the character meaning flatulence. It is all very interesting, but only a Chinese memory could retain it. The characters seem to us to be beautifully drawn (if that is the correct word), and Dr. Lucien-Graux is not only an enthusiast, but *the* enthusiast on his subject, for we understand that here he breaks new ground, and that this is the only collection of Chinese medical terms which has ever been compiled. This being so, we rejoice that the task has been enlivened by "*Vésprit gaulois*"; had it fallen into Teutonic hands, it must surely have been monumentally dull; but perhaps it would have been demonstrated that the Chinese Hippocrates, to whose genius we owe these symbols, was, like Newton, Shakespeare, and Dante, of the purest German descent, and no Chinese at all, save by the insignificant accident of birth.

The Ileo-Cæcal Valve. By A. H. RUTHERFORD, M.D.(Edin.). Pp. vii. + 63. With 22 Plates. London: H. K. Lewis. 1914. Price 6s. net.

THE author explains that the title is used "as a term applied to the orifice between the small and large intestines and the anatomical structures immediately adjacent and intimately concerned with this orifice. It is not used to denote the function of the ileo-cæcal valve."

It contains an account of the observations he made in a case in which there was an artificial anus in the cæcum 8 cms. long through which the interior of the cæcum could be observed, "also the ileo-cæcal orifice when it came into view," and a brief description of 32 specimens removed post mortem and hardened in formalin.

The specimens prepared in this way reproduced to a great extent

the appearances seen during life, with a slight amount of variation in the details in individual cases.

The work is somewhat loosely put together, and the descriptions are not always easy to follow.

Cane Sugar and Heart Disease. By ARTHUR GOULSTON, M.A., M.D. (Cantab.). Pp. 107. London: Baillière, Tindall & Cox. 1914. Price 5s. net.

IN this little book the writer sets forth his views on the treatment of myocardial failure by administration of cane sugar. A number of illustrative cases are appended. The treatment appears to have been followed in many cases by surprisingly good results, and the writer's picturesque descriptions are interesting if not always quite convincing.

NEW EDITIONS.

Forensic Medicine and Toxicology. By J. DIXON MANN, M.D., F.R.C.P. Fifth Edition, Revised and Enlarged by WILLIAM A. BREND, M.A., M.B., B.Sc. Pp. xii. + 717. With Plates and 25 Text Illustrations. London: Charles Griffin & Co., 1914. Price 18s. net.

THE fifth edition of the late Dr. Dixon Mann's well-known work on *Forensic Medicine and Toxicology* is now issued, and has been revised by Dr. W. A. Brend. He has done well to leave the work very much as it left the late author's hands. While doing so, however, Dr. Brend has been able to add still more to its value. Thus he has written almost entirely new chapters, dealing with such subjects as sudden death, professional privileges, obligations and responsibilities, malingering, Mental Deficiency Act, Workmen's Compensation Act, criminal drunkards, etc. The toxicological part of the volume has been well brought up to date, as is shown by the inclusion of such agents as veronal, aspirin, ferro-silicin, etc.

This new edition will give the late author's work a new lease of life, and it compares most favourably with other well-known text-books dealing with the subjects.

The Acute Abdomen. By WILLIAM HENRY BATTLE, Senior Surgeon to St. Thomas's Hospital, etc. Second Edition, Revised and Enlarged. Pp. xii. + 295. With 48 Illustrations. London: Constable & Co., Ltd. 1914. Price 10s. 6d. net.

THIS volume deals with abdominal injuries and acute abdominal diseases from the clinical standpoint. In it the author endeavours to express in concrete form opinions formed at first hand from his own practice, and compares his conclusions with those of other writers.

A special feature of the work is the considerable space devoted to abdominal injuries, a subject which is not as a rule so comprehensively dealt with in surgical text-books. The style and management of the work are good, and it should prove of interest not only to the operating surgeon, but to the practitioner who sees acute abdominal affections in their earlier stages.

Text-Book of Massage and Remedial Gymnastics. By L. L. DESPARD.
Second Edition. Pp. xiv. + 413. With 201 Illustrations.
London: Henry Frowde and Hodder & Stoughton. 1914.
Price 12s. 6d. net.

THIS text-book should prove of great assistance both to students of the art of massage and to those who are already professional masseurs. Many new illustrations and additions to the text have been made in the present edition. The muscles, bones, and joints are well described and illustrated, and the anatomy and physiology of the other systems are sufficiently detailed to give the student a good working knowledge of the subjects. The application of massage and the use of various remedial exercises are described in relation to injuries and to disease. Electrical methods in relation to massage are also discussed. Both from the theoretical and practical standpoint the text-book can be thoroughly recommended.

Rose and Carless's Manual of Surgery. Ninth Edition. Revised by ALBERT CARLESS, M.B., M.S., London, F.R.C.S. Pp. xii. + 1408. With 609 Figures and 16 Coloured Plates. London: Baillière, Tindall & Cox. 1914. Price 21s. net.

IT is three years since the eighth edition was published, and as surgery advances so rapidly the author has seen the necessity for a new edition. This manual has for so many years been one of the standard works on surgery that to extol its merits is unnecessary. The standard of excellence of the work is as high as ever, and the new chapters and illustrations added are a great asset to the book. The view the author takes in his chapter on radium treatment is most rational, and is, moreover, very practical and definite. The author has not accepted and used the Basle nomenclature, and this will restrict the use of his book in certain schools. The new coloured plates of pathological conditions and calculi brighten the book greatly, and the screens of bismuth meals are also very instructive. The only point that we would criticise in this edition is that owing to the thinness and transparency of the paper the print is somewhat indistinct. This may seem a small matter, but reading this book in artificial light will conduce to the straining of the eyes and headaches. The old stiff white paper was infinitely better for the reader.

NOTES ON BOOKS.

MR. H. WIPPELL GADD has issued a new edition of his *Synopsis of the British Pharmacopœia*, 8th edition (London, Baillière, Tindall & Cox, 1s. net), which gives in summary form the essentials of the 1914 Pharmacopœia. It is of vest-pocket size, contains a number of tables, and will prove handy for reference.

Among series of small pocket books on medicine Messrs. Baillière, Tindall & Cox's *Students' Aids* take a high place. They are written by men of standing, and are compiled with care and judgment. Dr. Harry Campbell's *Aids to Pathology* (price 3s. 6d. net) is now in its third edition, and contains much new material on hormones, anaphylaxis, and the cerebro-spinal fluid. It will be found useful for revising the subject before an examination, and, by those whose examination days are past, for refreshing the memory as occasion demands.

Dr. H. Clifford Barclay's *Lectures on Elementary Anatomy and Physiology* appears without date, publisher, or place of publication. From the title-page, however, we gather that the author hails from New Zealand, and that it is the second edition of a work that has been successful in Australia. The lectures are intended for nurses and for use in high schools; it should be noted that a chapter on reproduction and embryology is included. The book seems to us fairly well adapted for the class of readers for whom it is intended, though we doubt whether so extensive a knowledge of anatomy and physiology is really an advantage to non-professional persons.

We have so often commended the Practical Medicine Series of Reviews of the medical sciences that it is unnecessary to do more than refer to vol. ii. of series 1914. It deals with *General Surgery*, and is edited by John B. Murphy, M.D. (Chicago, The Year-Book Publishers, \$2 net), and has all the excellent qualities to which we are accustomed in this series.

To Dr. Murphy, also, we are indebted for a serial—*The Clinics of John B. Murphy, M.D.*—of which No. 5, vol. iii., containing a great deal of interesting matter, has just reached us. It is published bi-monthly by W. B. Saunders Co.

Dr. G. M. Mayberry has designed a *Sanatorium Case Register*, arranged for a complete record of the family and personal history, graphic representation of the physical signs, progress notes, and after-results. The registers are bound in volumes, the price ranging from £1, 5s. to £2, according to size (H. K. Lewis).

Thomas Shortt, Principal Medical Officer in St. Helena. By Arnold Chaplin, M.D. Pp. 70. With 2 portraits. London: Stanley, Paul & Co. Price 2s. net. Dr. Chaplin has collected under this title short biographical notes of the medical officers who were concerned in the treatment of Napoleon's last illness. Dr. Shortt, who was principal

medical officer of the island, appears to have occupied an exceedingly difficult position, his views not coinciding sufficiently with the official theories of Sir Hudson Lowe. He was obviously a man of considerable ability, and afterwards practised with success in Edinburgh, where he also did teaching work. He died in 1843, being at that time Inspector of Prisons in Great Britain. Other biographies given are those of Rutledge, Henry, Arnott, Verling, Burton, Baxter, and O'Meara. The book raises many interesting points regarding the Emperor's illness, and illustrates the difficulties with which the doctors had to contend. It may be warmly recommended to Napoleonic students, although the events which it describes are not such as to cause any pride in Great Britain's official behaviour. Should St. Helena be required again, it is to be hoped better and more sympathetic arrangements will be made.

Obiter Scripta: Throat, Nose, and Ear, by A. R. Friel, M.A., M.D. Pp. 37. Bristol: John Wright & Sons. 1914. Price 2s. 6d. net. This pamphlet contains some practical hints, based on the author's personal experience, which may be useful to beginners in ear, nose, and throat surgery. The chapter on zinc ionisation is quite well worth reading.

BOOKS RECEIVED.

- ALLEN, C. W. Local and Regional Anaesthesia (*W. B. Saunders Co.*) 25s.
 BARCLAY, H. C. Lectures on Elementary Anatomy and Physiology. Second Edition —
 BLISS, A. R., jun. A Laboratory Manual of Qualitative Chemical Analysis (*W. B. Saunders Co.*) 8s. 6d.
 THE British Pharmacopœia, 1914 (*The General Medical Council*) —
 CAMPBELL, H. Aids to Pathology. Third Edition (*Baillière, Tindall & Co.*) 3s.
 CLINICS of John B. Murphy, M.D. Vol. III., Nos. 4 and 5 (*W. B. Saunders Co.*) —
 DAVIS, E. P. Manual of Obstetrics (*W. B. Saunders Co.*) —
 DESPARD, L. L. Text-Book of Massage and Remedial Gymnastics. Second Edition (*Frowde, Huddell & Stoughton*) 12s. 6d.
 FAIRBAIRN, J. S. A Text-Book for Midwives (*Frowde, Huddell & Stoughton*) 10s. 6d.
 FRASER, J. E. The Anatomy of the Human Skeleton (*J. & A. Churchill*) 21s.
 GADD, H. W. A Synopsis of the British Pharmacopœia, 1914. (*Baillière, Tindall & Co.*) 1s.
 HEWITT, C. G. The House-Fly (*Cambridge University Press*) 15s.
 KELLY, H. A., and C. F. BURNHAM. Diseases of the Kidneys, Ureters, and Bladder. Vols. I. and II. (*D. Appleton & Co.*) 50s.
 LATHAM, A., and J. TORRENS. Medical Diagnosis (*J. & A. Churchill*) 15s.
 LLOYD, C. F. The Sale of Food and Drugs Acts, 1875-1907 (*Butterworth & Co.*) 8s. 6d.
 LUCAS, E. W. The Book of Prescriptions. Tenth Edition (*J. & A. Churchill*) 6s. 6d.
 LUCAS, E. W., and H. B. STEVENS. The Book of Pharmacopœias (*J. & A. Churchill*) 7s. 6d.
 LUFF, A. P., and H. G. H. CANDY. A Manual of Chemistry. Fifth Edition (*Cassell & Co., Ltd.*) 8s. 6d.
 McLENNAN, A. Surgical Materials and their Uses (*Edward Arnold*) 4s. 6d.
 MAY, C. H., and CLAUD WORTH. A Manual of Diseases of the Eye. Fourth Edition (*Baillière, Tindall & Co.*) 10s. 6d.
 MAYBERRY, G. M. Sanatorium Case Register (*H. K. Lewis*) —
 MILES, E., and C. H. COLLINS. The Uric Acid Fetish (*Eustace Miles*) 1s. 6d.
 MOYNIHAN, SIR BERKELEY. Abdominal Operations. Vols. I. and II. Third Edition (*W. B. Saunders Co.*) 42s.
 PRACTICAL Medicine Series, 1914. General Surgery. Vol. II. (*Chicago Year Book Publishers*) 2 dols.
 SOMERVILLE, D. Practical Sanitary Science. Second Edition (*Baillière, Tindall & Co.*) 10s. 6d.
 THE Practitioner's Guide to Clinical Research (*The Clinical Research Association, Ltd.*) —
 WHITLA, W. Elements of Pharmacy, Materia Medica, and Therapeutics. Tenth Edition (*Baillière, Tindall & Co.*) 9s.
 WRIGHT, J., and HARMON SMITH. Diseases of the Nose and Throat (*Baillière, Tindall & Co.*) 21s.

EDINBURGH

MEDICAL JOURNAL.

EDITORIAL NOTES.

The Signs of "Congenital Debility" in Childhood. REPORTS on the medical examination of school children too often degenerate into arid columns of statistics, which, however important for comparative purposes, and however valuable they may prove to future investigators, are seldom of interest to clinical observers. In this field of work, however, there are many opportunities for studying the incidence of slight deviations from health, or quasi-pathological signs, and estimating their true significance in a way which is impossible when only children attending hospital clinics are available. A case in point is the investigation made by Dr. Leipoldt into the presence of Stiller's signs of malnutrition in London school children, which is published in the *Annual Report of the London County Council for 1913*,* just issued.

All who have had experience in school inspection recognise a class of child which will be described by one observer as "congenitally debilitated," by another as "the nervous type," by another as "pre-tubercular," and so on. They are the delicate children who are often ill, frequently absent from school, suffer from night-terrors, often become tuberculous, and easily fall victims to overwork. Their characteristics are, however, so indefinite that it has been doubted whether any good object was attained by relegating them to a special type, and any common physical sign or stigma which will aid in giving definition to this class of children would be of great service. Some years ago Professor Berthold Stiller of Buda-Pesth stated that in these patients a skeletal anomaly, in the shape of a floating tenth rib, was fairly constant, and he expressed the view that it was possible to recognise as a clinical entity an asthenic constitution which he named "asthenia universalis congenita." In this syndrome are included a number of signs which have long been familiar:—Thin, slight figure, with gracile skeleton and ill-developed musculature, pallor without

* Vol. iii. p. 124 *et seq.*

definite anæmia, slight cardiac signs—bruits, marked respiratory irregularity, tendency to glandular enlargement, orthotic albuminuria, want of co-ordination, nervousness, tics, slight choreic movements, easily elicited tendon reflexes, flat-foot, slight scoliosis, liability to fatigue, atony of the digestive organs, and constipation—a general description which fits in pretty closely with the “sanguine type of scrofula” of the past generation, or the “pretuberculosis” of this. It is in cases of this kind that the floating tenth rib is said to be common.

Normally, the tenth rib is united to the sternum by its costal cartilage, which joins the costal cartilage of the ninth rib. The eleventh and twelfth ribs are free. In a small proportion of persons the tenth rib is also free like the eleventh and twelfth, and in a much larger proportion, though not floating, it is fairly movable, its junction to the ninth costal cartilage being represented merely by a thin strand of cartilage which allows its point to be pushed upwards or downwards by the examiner. This is the “costal sign” of Stiller, by whom it is regarded as a strong accessory proof of the existence of the asthenic habit of body.

Dr. Leipoldt has investigated the incidence and significance of these two signs—the floating tenth rib and the costal sign—in some 3500 children, and his results bear out the inference he draws, that these stigmata are not without importance. In such cases there is usually a bad family history, showing a disposition towards tuberculosis, nervous disease, or gastric disease. By following up the children he found that the prospect of improvement in nutrition was not so good as in ill-nourished children in whom the signs were absent. Among 1093 boys, 181 showed the costal sign, 4 the floating rib; among 2105 girls, 382 had the costal sign, and 14 the floating rib—together about 17 per cent. and 0·5 per cent. respectively. About one-third of the boys affected and one-eighth of the girls appeared to be otherwise normal at the time of examination. Even in these “normal” children, however, the bad family antecedents were common, and one or two of them subsequently broke down in health. It would seem desirable to keep an especially close watch on such children, both for their own sakes and to ascertain whether there is, in fact, such a thing as a “latent congenital asthenia,” of which the costal sign may be for a time the only evidence.

The abnormalities and diseases met with among the other cases are fairly covered in a general way by the description of the syndrome already given. We may notice, however, among the nervous defects observed, idioglossia, various phobias, and psychical disturbance, somnambulism, night-terrors, enuresis, habit spasms, and stammering; among postural deformities, flat-foot and spinal curvature; among gastric and abdominal conditions, tenderness in the right iliac fossa, chronic appendicitis, and indigestion; on the other hand, none of the

children showed signs of congenital syphilis, and children definitely tuberculous were excluded from the series. In regard to the general nutrition, the most interesting point brought out is that in the majority it was a matter of opinion whether they should be classed as "3" or "4" ("subnormal" or "bad"). It was found that in comparison with cases not showing Stiller's signs, in whom the same question arose, the latter improved markedly when they had the benefit of fresh air and good food, whereas, under similar conditions, the nutrition of the children showing the signs did not progress nearly so satisfactorily. These facts suggest that the costal sign is an aid in the prognosis of a case of malnutrition; it is, perhaps, an overstatement to describe all these children as potential neurasthenics and consumptives, but the presumption is considerable that they are constitutionally feeble and possessed of inferior power of resisting illness.

From the general physician's point of view the ability to differentiate among ill-nourished children those who suffer from a definite type of constitutional asthenia would be a real gain as regards prognosis and management. It is therefore to be hoped that Dr. Leipoldt's observations will be repeated in other centres, because in the nature of the case the collective statistical method seems the only one by which the value of these stigmata can be accurately estimated.

The Medical Service. IN a dispatch published on the 16th February Field-Marshal Sir John French pays a generous tribute to the work accomplished by the Royal Army Medical Corps.

"Since the commencement of hostilities the work of the Royal Army Medical Corps has been carried out with untiring zeal, skill, and devotion. Whether at the front under conditions such as obtained during the fighting on the Aisne, when casualties were heavy and accommodation for their reception had to be improvised, or on the line of communications, where an average of some 11,000 patients have been daily under treatment, the organisation of the medical services has always been equal to the demands made upon it.

"The careful system of sanitation introduced into the Army has, with the assistance of other measures, kept the troops free from any epidemic, in support of which it is to be noticed that since the commencement of the war some 500 cases only of enteric have occurred.

"The organisation for the first time in war of motor ambulance convoys is due to the initiative and organising powers of Surgeon-General T. J. O'Donnell, D.S.O., ably assisted by Major P. Evans, Royal Army Medical Corps.

"Two of these convoys, composed entirely of Red Cross Society personnel, have done excellent work under the superintendence of Regular Medical Officers.

"Twelve hospital trains ply between the front and the various bases. I have visited several of the trains when halted in stations, and have found them conducted with great comfort and efficiency.

"During the more recent phase of the campaign the creation of rest depôts at the front has materially reduced the wastage of men to the line of communications.

"Since the latter part of October 1914 the whole of the medical arrangements have been in the hands of Surgeon-General Sir A. T. Sloggett, C.M.G., K.H.S., under whom Surgeon-General T. P. Woodhouse and Surgeon-General T. J. O'Donnell have been responsible for the organisation on the line of communications and at the front respectively."

CASUALTIES.

CAPTAIN JAMES ALEXANDER TERRAS BELL is reported to have died in Egypt.

Captain Bell graduated M.B., C.M., in the University of Edinburgh in 1895, and M.D. with Honours in 1902. After acting as House-Physician in various hospitals in this country and in South Africa, he settled at Christchurch, New Zealand. He accompanied the New Zealand contingent to Egypt for service in the war.

KILLED in action, Lieutenant SIDNEY C. HUDDLESTONE, M.B., Ch.B.

Lieutenant Huddleston graduated in the University of Edinburgh in 1914. On the outbreak of the war he obtained a commission in the Black Watch. He was killed while leading a company of that regiment in a counter attack on some trenches.

CLASP TO VICTORIA CROSS.

LIEUT. ARTHUR MARTIN LEAKE, R.A.M.C., who was awarded the Victoria Cross on 13th May 1902, is granted a Clasp for conspicuous bravery in the present campaign.

For most conspicuous bravery and devotion to duty throughout the campaign, especially during the period 29th October to 8th November 1914, near Zonnebeke, in rescuing, whilst exposed to constant fire, a large number of the wounded who were lying close to the enemy's trenches.

The following is the official description of the act for which Lieutenant Leake received the Victoria Cross in 1902:

During the action at Vlakkfontein, on 8th February 1902, Surgeon-Captain Martin Leake went up to a wounded man and attended to him under a heavy fire from about forty Boers at 100 yards range. He then went to the assistance of a wounded officer, and, whilst trying to place him in a comfortable position, was shot three times, but would not give in till he rolled over thoroughly exhausted. All the eight men at this point were wounded, and while they were lying on the veldt Surgeon-Captain Martin Leake refused water till everyone else had been served.—*Times*.

War Honours.

At least the following Edinburgh University men appear in the recent dispatches :—

Lient. T. H. Balfour, M.B. (1909); Capt. M. C. Beatty, M.B. (1900); Major R. B. Black, M.B. (1897); Major E. T. F. Birrell, M.B. (1895); Lieut. A. E. Bulloch, M.B. (1888); Capt. V. T. Carruthers, M.B. (1904); Lieut.-Col. R. J. Copeland, M.B. (1886); Lieut. F. J. Davidson, M.B. (1908); Lieut. J. M. Glass, M.B. (1903); Capt. A. W. M. Harvey, M.B. (1902); Lieut. E. C. Lang, M.B. (1910); Lieut.-Col. C. B. Lawson, M.B. (1889); Lieut. D. Murray Lyon, M.B. (1910); Major A. J. Macdougall, M.B. (1894); Surgeon-General W. G. Macpherson, M.A., M.B. (1882); Lieut.-Col. A. H. Moorhead, M.B. (1893); Lieut. Edgar Percival, M.B.; Capt. E. T. Potts, M.D. (1901); Major M. M. Rattray, M.B. (1893); Capt. T. H. Scott, M.B. (1906); Major J. P. Silver, M.B. (1893); Major E. W. Slayter, M.B. (1891); Capt. T. B. Unwin, M.B. (1899); Capt. S. J. A. Hall Walshe, M.B.

The above are connected with the Army Medical Service.

Major E. Craig Brown, Cameron Highlanders (alumnus).

Major P. C. De La Pryme, A.S.C. This officer was senior president of the Students' Representative Council in 1899, when he volunteered for service in the South African Campaign. He remained in the Army.

Captain J. C. W. Connel, K.O.S.B., late O.T.C. Adjutant.

Lieutenant J. Bartholomew, Gordon Highlanders (student).

Some of the above have also received decorations, viz. :—

To be Companion of the Order of the Bath—Surgeon-General W. G. Macpherson, C.M.G., M.B.

To be Companion of the Order of St. Michael and St. George—Major E. T. F. Birrell, M.B.

To be Companions of the Distinguished Service Order—Major E. Craig Brown, Captain J. C. W. Connell, Captain S. J. A. H. Walshe, Captain E. T. Potts.

Awarded the Military Cross—Captain T. H. Scott, Lieutenant F. C. Davidson, Lieutenant T. H. Balfour.

To be Brevet Colonels—Lieutenant-Colonel C. B. Lawson, M.B.; Lieutenant-Colonel A. H. Moorhead, M.B.

**Edinburgh Royal
Infirmary Nurses.**

SEVERAL nurses trained at the Royal Infirmary of Edinburgh have been mentioned in General French's dispatches.

Miss Elizabeth Tully, selected from the Civil Reserve of Nurses guaranteed by the Royal Infirmary, was sent with the first party for active service. She has been working on an ambulance train for the greater part of her time abroad, and has been under fire. For some

years past she has held the position of matron of the Ann Street Nursing Home, and she comes from Morebattle, Kelso.

Miss J. Dods and Miss H. Reid, also mentioned in dispatches, are both matrons in the Queen Alexandra Imperial Military Nursing Service, and were trained in the Royal Infirmary.—*Scotsman*.

ANNOUNCEMENT BY THE COMMITTEE OF MANAGEMENT OF THE TRIPLE QUALIFICATION OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, *re* RECOGNITION OF WAR SERVICE IN LIEU OF CURRICULUM.

THE Committee of Management of the Triple Qualification begs to announce to students who have undertaken approved service with His Majesty's forces, that applications for partial recognition of such work in lieu of curriculum will be individually considered. Steps will be taken in each case to grant such concessions as appear to the Committee to be in accordance with the recommendations of the General Medical Council.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—

At the quarterly examinations of the above Board, held in Edinburgh in January, the following candidates passed the *first examination*:—C. V. A. Menon, Malabar, and K. S. Bhiwandiwalla, Bombay. Passed in *Physics*, Miss Rebecca Goodman, Gordon S. Woodhead, William B. Stott, John L. Gibson; in *Biology*, G. ap V. Jones and Joseph R. Welply; and in *Chemistry*, Frederic L. Jones and Miss Muriel Keyes.

The following candidates passed the *second examination*:—S. D. Vania, Rawalpindi; Robert G. Battersby, Glasgow; Lawson L. Steele, Cumberland; Thomas Jackson, Wishaw; Thomas R. Wilson, Glasgow; Alfred Black, Cookstown; Don Adrian Jayasingha, Ceylon; and A. P. F. Abeyseriya, Ceylon. Passed in *Anatomy*, Oswald Johnston and Buenaventure Ramirez; and in *Physiology* Harold G. Smith and Miss Janie I. M'Birnie.

The following candidates passed the *third examination*:—Charles Harris, Greenock; Henry V. Fitzgerald, Ireland; Robert M'Gregor, Scotland; William M'Alpine, Wishaw; Andrew Mathewson, Newton-Stewart; Edward Spence, Roxburgh; and John A. Smith, Glasgow. Passed in *Pathology*, Frederick C. J. Mitchell and Iwan Davies; and in *Materia Medica*, James S. Durward, Owen G. Evans, Frederick J. Jack, Harry Morley, Norman S. Bruce, John J. Mulvey, and Paul Vertannes.

The following candidates, having passed the *final examination*, were admitted L.R.C.P.E., L.R.C.S.E., L.R.F.P. & S.G.:—Maurice Michael Fitzgerald,

Co. Limerick; William Hamilton Wray, Ireland; Sarah Louisa Rook, Gateshead; Jacobus Johannes de Waal, South Africa; Harold Oliver Martin, Nottingham; Cawton Frank Pereira, Bombay; Andrew Finlay Readdie, Edinburgh; Horace Palmer Margetts, Warwick; George Barker Charnock, Manchester; Charles Clouston Irvine, Arran; Harold Damant Atherstone, Cape Colony; Claude Trevor Darwent, Trinidad; John Kenneth Garner, Preston; Gerald Douglas Newton, Newcastle-on-Tyne. Passed in *Medicine*, Percy Chisholm, John Adami, William L. Coullie, and Alexander G. M'Kee; in *Midwifery*, Arthur M. Burge, T. Janakiramiah, George E. Mendis, and Percy Chisholm; and in *Medical Jurisprudence*, Octavus W. Bateman, Bak Hin Ong, Henry V. Fitzgerald, Victor A. Goonetilleke, Oswald Brunlees, G. T. Makhijani, Thomas C. MacGowan, Charles E. Meryon, Arthur Craig, and John P. Fairley.

CLINICAL STUDIES. I.—NOTE ON A REMARKABLE (TEMPORARY) CONDITION OF THE PULSE IN TWO CASES OF STOKES-ADAMS' DISEASE WITH HEART-BLOCK.

By BYROM BRAMWELL, M.D., F.R.C.P.E., LL.D., F.R.S.E., Consulting Physician, Royal Infirmary, Edinburgh; Physician, Chalmers Hospital, Edinburgh.

STOKES-ADAMS' disease is rare, and it very seldom happens, in my experience, that the physician has an opportunity of observing the condition of the patient during the syncopal attacks. The object of this paper is to record a remarkable condition of the pulse which I have observed in two cases. In both there appeared to be complete heart-block; in both cases the normal pulse was very slow—30 and 28 per minute respectively; in both, immediately after the attack, the pulse frequency for a brief period, lasting, in the first case, for a minute and a half, and in the second for two and a half minutes, was 120 to 130 beats per minute. I regret that I have not been able to take tracings in either case.

It is, I think, extremely difficult to offer a satisfactory explanation of this condition. In complete heart-block the action of the auricle and ventricle is independent, the ventricle usually contracting about 30 times per minute. The syncopal attacks in Stokes-Adams' disease associated with complete heart-block appear to be due to cerebral anæmia the result of arrested action of the slowly contracting ventricle. In the two cases which I am recording, as the syncopal attack passed off and before the ventricular contraction was re-established, a very small, feeble radial pulse, numbering 120 to 130 beats per minute, occurred for a brief period. I suggest that these small radial pulsations were due to contractions of the auricle and not of the ventricle.

The long duration of the stage of unconsciousness in some of the syncopal attacks (more than half an hour) in the first case is remarkable. The leading features of the cases, so far as the point under investigation is concerned, were as follows:—

CASE I.—Female, aged 61, was seen in consultation on 25th July 1912, suffering from Stokes-Adams' disease and complete heart-block.

I had seen this patient in the year 1905; she was then suffering from a slightly dilated heart with a mitral systolic

murmur; she had never had rheumatism or rheumatic fever, and up to the time of this illness had been a healthy woman. After recovering from this illness she enjoyed good health until the summer of 1911, when she suffered from the same condition—slight dilatation of the heart, shortness of breath, etc. In October 1911 she went to Australia and was ill on the voyage. Five weeks after her arrival in Australia she suffered from epileptiform attacks, with slow pulse (26 per minute). For a time she was very ill, then improved, and was sent home with a nurse. On the return voyage she had two syncopal attacks. She arrived home in the middle of July looking well.

On 21st July 1912 she had a syncopal attack; it was preceded by a disordered condition of the stomach (foul tongue, sickness, and vomiting). During the four following days she had several syncopal attacks; in one of these attacks she was quite unconscious, pulseless, and apparently dead for a quarter of an hour.

On 25th July I found her very bright and cheerful; the radial pulse was 30 per minute, full and regular, and of somewhat high tension; the heart was slightly dilated; no murmur was audible. The urine, which was normal in amount and of normal specific gravity, contained a small amount of albumen; the tongue was clean; the bowels apt to be constipated.

While I was consulting with the doctor the nurse suddenly summoned us, saying that the patient was in an attack. I found her insensible and cyanosed; the limbs were rigid and the head was turned to the right; there were no twitchings. The radial pulse could not be felt and the heart sounds could not be heard. There were no respiratory movements, and the patient appeared to be dead. She remained insensible for a few minutes after I reached her bedside; the cyanosis then disappeared, the pulse became perceptible, and she completely regained consciousness. For a minute and a half after the pulse returned it was very small in volume, and from 120 to 132 per minute (10 to 11 beats to each five seconds); then it regained its usual volume and frequency (30 beats per minute).

The patient stated that the syncopal attacks were usually preceded by flatulent dyspepsia; that they were apt to come on during close, thundery weather; that turning on the left side was apt to bring on an attack; that immediately before the attacks she had a rushing noise in the ears (the hearing was normal; there was no tinnitus; there had never been any ear discharge).

Treatment.—Strychnine (2 minims, three times daily, gradually increased to 8 three times daily) was prescribed. The patient was also advised to regulate her diet very carefully; to see that the bowels were sufficiently freely opened every day; and, if the stomach should become disordered, to take an alkaline mixture containing bicarbonate of potash, bicarbonate of soda, tincture of rhubarb, and infusion of calumba.

It was suggested that strychnine hypodermically (5 minims of the liquor) should be given during the syncopal attacks.

Subsequent Progress of the Case.—On the day after my visit there were five, and the following day two, syncopal attacks; after this the patient gradually improved. Syncopal attacks occurred on 1st September 1913 and 2nd June and 24th September 1914. The pulse-rate continued to be 30 to 32 per minute.

On 29th September 1914 I had the opportunity of seeing the patient again. She looked very well and had gained in weight; the radial pulse numbered 30 per minute; the blood-pressure was 235 m. Hg; the urine contained a small trace of albumen and a few hyaline casts; the amount of urine passed *per diem* was normal; the heart was slightly dilated; no murmur could be heard. Her ordinary medical attendant informed me that during the past year the patient had continued to take three minims of liquor strychninæ thrice daily, and had attended carefully to her diet and to the condition of the stomach and bowels.

On 17th January 1915 her doctor wrote me:—"Until three weeks ago the patient was very well; then, possibly due to a mental shock (the death of an old friend), she had a relapse—several very severe syncopal attacks; in one she was unconscious for thirty minutes and in another for more than thirty minutes; in the latter of these attacks the radial pulse could not be felt, but pulsation (? venous) in the neck could be felt. The breathing at the beginning of the attack was stertorous, very slow and laboured."

CASE II.—Male, aged 62, a farmer, was seen in consultation on 18th February 1914.

The patient was a big, strongly-built farmer—height 5 ft. 11¼ ins.; weight 15 st. 12 lbs. He looked less than his age. With the exception of an attack of pneumonia at the age of 17 he had never been ill until the present illness commenced.

For six months before I saw him he had complained of tightness over the chest on going uphill and occasionally of giddiness.

During the two days preceding my visit he had several syncopal attacks. For some days before the syncopal attacks occurred the stomach had been deranged (flatulent dyspepsia). On the day of my visit five syncopal attacks occurred. Each of the attacks lasted for about a minute. During the attacks his wife thought he was dead; he was completely insensible, the eyes were turned up, there was slight twitching of the face.

On examination, the pulse numbered 28 per minute; it was of large volume, quite regular, and of high tension. The heart appeared to be of normal size; the apex, however, could not be felt owing to the thick chest wall. A short, soft systolic murmur was audible in the aortic region. There had been no cardiac pain or angina. The urine was normal.

While I was in the house a syncopal attack occurred. During the attack the face was slightly cyanosed and the patient was completely insensible. After the attack had lasted for about a minute and a half the face became pale and the patient became completely conscious. During the attack the pulse could not be felt. For about two minutes and a half after the patient became conscious the pulse-rate was 120 per minute; then it fell to its usual frequency (28 per minute).

Treatment.—Strychnine (5 minims of the liquor, three times daily), an alkaline mixture, and soda mint tabloids were prescribed.

Subsequent Progress of the Case.—During the following fortnight two or three syncopal attacks occurred every day; they then became much less frequent and less severe.

On 7th May 1914 I had another opportunity of seeing the patient. There had only been two attacks during the preceding ten weeks. The patient looked and felt quite well; his digestion had improved; he was no longer short of breath; the radial pulse numbered 84 per minute (this was after exertion—walking from the station); the apex beat was in the 5th interspace, slightly outside the normal position; a soft, systolic murmur was audible both in the aortic and mitral areas. The urine was normal.

On 19th January 1915 his doctor wrote me:—"The patient has been very well since you last saw him; he has had no further attacks. His pulse-rate to-day is 66; he has resumed his usual mode of life, attending to business in county council, etc., and feels in better health than he has been for two years. He is still taking the mixture of strychnine, arsenic, and pepsin, but only one dose per day."

THE ALCOHOL POISON AND ITS VICTIMS.

By JOHN STRACHAN, M.D.

WHILE my object in the following paper is to deal especially with the poisonous effects of alcohol, I take no exception to the pronouncement by certain eminent London physicians, published in the *Lancet*, that "taken in moderation and used with discretion it is a useful and beneficial article of diet." We may take it as certain that such is the experience and the opinion of practically all who *so take and use* alcohol, and that no amount of alarmist writing and lecturing will convince them to the contrary. It is equally certain, however, that, taken beyond a certain quantity, varying with the individual, it acts as a narcotic poison, even to the extent of causing coma and death. To clear the ground for a proper consideration of this latter and dangerous property of alcohol as it affects a certain class of persons, I shall endeavour to state what I take to be the rationale of its use and abuse as a food.

As indicated by its chemical composition (C_2H_6O), alcohol is a pure fuel to the blood, the carbon and hydrogen being in a highly combustible form, as shown when ignited in the atmosphere. From its rapid oxidation in the blood it acts as a stimulus to the *vital* powers, running these, so to speak, at high pressure without, *per se*, providing material of physical strength. By its action thus upon the brain and nervous system it produces a pleasurable sense of exhilaration, which may be held as the object for which it is taken; while by stimulating the gastric glands it may increase appetite and aid digestion. The purer spirits, as whisky, brandy, and gin, have no other than such temporary effect, serving the temporary purpose of helping on conversation and social conviviality; wine and beer in virtue of the extractives, albuminoids, etc., contained have a more continued and sustaining effect. Taken with meals and in moderation they all add to the pleasure of such social functions and do no apparent harm. To this extent there seems no reason to dispute the *dictum* that such beverages are a useful and beneficial article of diet; and I believe that, in these days, very few of the multitudes who, among the better classes, use alcohol exceed the strictest moderation.

As with all sensual pleasures, the stimulating effect of alcohol may be carried to excess and thus become a *vice*—beyond the stage of mild exhilaration to that of pleasurable excitement, when toxic action sets in, disturbing the sense of equilibrium and confusing

the mental functions; the controlling and regulating power of reason and judgment is reduced; while sensual and emotional impulses are excited, causing excessive and foolish talking, boisterous laughter, uproarious shouting and singing, and maudlin affection, or, with other natures, cursing and swearing, quarrelling and fighting. In all this it is the pleasure of stimulation which is sought and carried beyond the bounds of reason and propriety, the partial narcosis being a hindrance to, not a part of, the enjoyment. This class of inebriate is "happy," "jolly," "glorious," or maudlin, according to the state of intoxication, which is seldom carried to the length of complete narcosis or being "dead drunk"; above all he is sociable, seeking the company of boon companions, parading the streets, disturbing public meetings, and making a fool of himself at social gatherings. The *over-indulgence* is deliberate with the definite object of reaching the desired degree of excitation, and is, to begin with, at all events, fully under control of the will. It is, to a great extent, ruled by *occasion*, being seldom allowed to interfere with necessary conditions of employment, but kept for holidays, pay-day, pleasure excursions, etc.; or, in the few cases of its survival among the better classes, after dinner when the day's duties are understood to be over. By frequent repetition the power of resistance, when opportunity offers, diminishes, and inebriety becomes habitual, encroaching more and more upon the calls of duty, with disastrous effect upon industrial or professional employment. Still the characteristic features remain the same, and come fully under the designation I propose of *The Vice of Occasional and Habitual Inebriety*.

Time was when what is now rightly regarded as a low and degrading vice was looked upon by men of all classes as, on convivial and festive occasions, the height of good-fellowship; and habitual over-indulgence was very general. With the spread of education and a higher tone of ethics in Society, due greatly to the influence of Royalty, along with the good work of the temperance movement, those days are now happily over, and alcohol intoxication in any degree of this deliberate and occasional form is almost entirely confined to the lowest orders in the community. As affecting the gentler sex, it is, and always has been, utterly reprobated, and is altogether unknown among women with any pretension to education and refinement.

This form of alcoholic excess is not, *per se*, as a rule injurious to health. The drunkard, after a carouse, is generally quite fit

for work next day; and, apart from injury from accident or exposure, may continue the vice, even in extreme degree, to the full average of human life. It may be said that here it is not the alcohol which is the evil, but the vicious abuse of it, which is in too small a proportion to the legitimate use to be held as ground for condemning the latter. While it is still deplorably prevalent among the "working class," the great improvement which has taken place indicates that the temperance movement is on right lines, and may be trusted to continue the good work, with every hope and prayer for further and still further success.

I have been thus particular in detailing what I take to be the characteristic features of the *vice* of "Occasional Drunkenness" in order the more clearly to distinguish the very different form of inebriety which I propose to designate "Constitutional Alcoholism."

Constitutional Alcoholism.—"What is one man's food is another man's poison" is a saying very specially applicable to alcohol, which, with certain constitutions, acts almost entirely as a narcotic poison. It must be very much within the experience of all that with some persons the stimulant and exhilarating effect of alcoholic excess, if present at all, very quickly gives place to a dull, heavy lethargy and general drowsy inclination, soon passing, with a continuance of the drink, into a more or less comatose condition. It is a matter also of lamentably common experience that certain and, my contention is, the same class of persons become "slaves to alcohol," giving way more or less periodically to "bouts of drinking" which, far from having regard to occasion and necessary conditions of employment, entirely dominate for the time the conduct and whole being of the victim, and ultimately, if continued, bring him *or her* to social and material ruin and degradation, and to mental and physical wreckage and death. Such cases are very far from being confined to the low and vicious, or to any one class or either sex in the community, and are very far from diminishing with the spread of education and culture. There is reason to believe that they are increasingly prevalent among the highest in the land, among the most educated and refined, ay, and the most religious; and not less among the gentler than the rougher sex. A very considerable proportion of families in all grades of Society count at least one such "black sheep" in the fold; and, in not a few, every member, male and female, has been known to "go wrong" in this way. Such inebriates are not of the hilarious and noisy type and come little under notice of the public; they incline to retirement and secrecy, rather than

companionship, in their cups, and seek to hide, while hugging to their bosom, the poison which is wrecking their lives.

In the above short description of what may be considered the types of these cases I hope enough has been said to mark off the distinction between the two forms of inebriety which are such a blot upon the fair face of Society in this country. In both, the object sought is the *effect* not the *taste* of alcohol; but while the one is a voluntary and deliberate over-indulgence in a pleasurable excitement, the other, as I shall now endeavour to explain, is a craving for relief from an overwhelming sense of nervous depression and misery. The one is a moral and social vice, the other is a very terrible, long-drawn-out, and, unless cured, ultimately fatal or worse than fatal disease of the nervous system. It is with the latter only I propose to deal in the following pages, and for it I claim exclusively medical concern.

The etiology of this distressing malady may be stated somewhat as follows:—To begin with there is an idiosyncrasy or nervous diathesis, rendering the person specially susceptible to the *narcotic* effect of alcohol, which is followed by a reaction of nervous depression and irritability. Such persons are of a sensitive and emotional nervous temperament, and are probably subject, even under normal conditions, to times of “low spirits” and sense of depression, which, although scarcely observable even by themselves, suggest a stimulus. This, in the case of men, is, as whisky, all too readily at hand. Ladies are much less exposed to temptation, the harmless tea being the usual and fashionable restorative, or the mild stimulus of a glass of claret may be taken with impunity; brandy or whisky is, however, sometimes resorted to, and is sometimes even prescribed by the doctor, to the very great danger of the patient. The immediate effect of the whisky or brandy is very comforting, soothing and bracing the nerves, and convincing the sufferer that it is the best remedy for his or her complaint. After a time reaction sets in, suggesting another dose of the remedy. At first the fear of giving way to intemperance may cause this to be resisted, and the approach of night, with the true remedy of rest and sleep, will avert danger for the time. The poison, however, has entered the system, and begins its work upon the weak spot in the nerve centre, giving rise to a progressive neurosis which renders future resistance more and more difficult. The next period of depression will be more pronounced, and recollection of the comfort formerly derived from a “drop of whisky” causes that remedy to be more speedily and effectively resorted to.

Again there is immediate relief and comfort for a time, and again the reaction, with a strong desire for a repetition of the dose. Time after time this desire may be withstood through fear of taking too much, and the attacks pass off without this, no harm, it is thought, being done by the one glass. Every glass, however, feeds the neurosis, increasing the severity of the succeeding attack, and weakening the power of resistance to the *craving for relief* from the deeper and deeper depression and misery of the reaction. So the struggle against *drinking to excess* may go on for months or years without a suspicion of more than a disordered liver or stomach causing "those wretched attacks which nothing relieves so quickly as a little spirits."

Sooner or later resistance is overcome, and the citadel handed over to the drink fiend to work his will. The old fear of giving way to intemperance gives place to that of being found out, and secrecy replaces the restraint of public opinion. Larger doses are taken, and repeated to the extent of causing a semi-stupor, noticeably affecting speech and manner. Friends and relations may now remonstrate, and the victim may become alarmed and make good resolutions for the future. He admits having been foolish and "gone over the score" that time, but promises to be more careful. Such resolutions and promises are, however, held to refer only to moderation, interpreted as only one glass, which does him "a lot of good and can do no one any harm," friends as a rule being satisfied with this. The harm done by the one glass is that it puts the attack beyond the possibility of individual control. There was misery before it was taken, but there is horror after the narcosis passes off, driving the victim with demoniac power to any extremity for the means of escape from the hell which comes with each awakening. The stomach now refuses all food, and vitality is maintained only by the fire which is consuming it. The attack usually ends with acute gastric catarrh and extreme cardiac and nervous prostration, culminating, it may be, in delirium tremens. From this there is gradual recovery, with no desire for, or even a repugnance to, spirits in any form till the period comes round again, the interval becoming shorter as the disease progresses. At these times the whole dreadful drama is enacted over and over again and again and again, till refuge is found in an inebriate home, a lunatic asylum, or an early grave. A victim, a very intelligent Scottish innkeeper, thus expressed himself to me: "Man, the now, if I was soomin' in whisky, I wouldna put doon ma mouth to tak' a sook; but the time'll come when if it

was to be ma last breath I couldna keep frae't." Another, when surprise was expressed at his finding any pleasure in getting into a state of intoxication, replied, "Oh, it's no that bad to get drunk; but eh, man! it's *horrible to get sober.*"

There are, no doubt, degrees in the diathesis, and consequent modification of its manifestation under the action of the poison, tending to confuse the issue as between the vice and the disease; thus, in some cases, the latter may seem to develop from a long course of over-indulgence, and take the chronic form of a continual sottish booze, in contrast with the acute attack of the markedly periodic form. Still there is the distinguishing feature of the predominance of the narcosis over the excitement of stimulation which may be taken as symptomatic of the disease. No such previous over-indulgence, however, is necessary to its development in the more typical cases. These, at the beginning, are, even in their severest form, quite compatible with the ordinary ethics of strict moderation, and are therefore removed altogether from the immoral stigma of the vice of drunkenness.

I hope enough has been said to differentiate the disease of constitutional inebriety, to remove from it the opprobrium of moral depravity, and to bring it, more distinctly than has been the case hitherto, within the scope of medical concern and treatment. I shall now endeavour to indicate the lines upon which we may hope for some success in combating this dire national curse as regards (1) prevention, where the diathesis may be known or supposed to exist; and (2) the treatment and cure of those already afflicted.

Prevention.—Although the number of constitutional inebriates in any community may not be so large as to attract much notice, yet when we consider the universality of the poison and the continuance of its action it may be doubted if any other disease claims so many victims. Taking the proportion as 1 per cent. of those who use alcoholic beverages, and these, as has been estimated, as half the population, it will give the number of wrecked lives throughout the British Isles at any one time as 185,457, which is probably well within the mark. It is certain that all such cases are preventable. They arise directly from a specific, a well-known, and a perfectly manageable poison, which is already the subject of legislative restriction, and might by a slight amendment of existing law be very effectively dealt with. Meanwhile it is within the power of every individual entirely to safeguard himself or herself from all risk in this respect by total abstinence from alcohol. Where the danger is only as 1 per cent. it is not

sufficiently alarming to influence many to this extent. With those, however, who are constitutionally predisposed to the disease, the proportion is all the other way; with men, indeed, who follow the usual drinking customs of the country, it may be said to amount to 100 per cent. It is, then, of the utmost importance that these should be put specially on their guard. The difficulty is to differentiate from the rest of the community and convince them of their danger. So far as this can be done it is as much within the province of the family medical attendant to regulate the regimen with this as with any other known tendency to disease.

Speaking generally, in view of their finer and more susceptible nervous temperament, as well as the evidence of many years' observation and experience, I am strongly of opinion that *all* women require to be specially careful in their use of alcohol. Fortunately this is recognised in the prevailing customs of the country, and women, as compared with men, are very little exposed to danger in this respect. There was a time, within the memory of some of us, when it was a kind of fashion with some in the medical profession to prescribe a mid-meal dose of brandy to delicate ladies, with, as soon became apparent, most disastrous results. The experience of those days, and of many terribly sad cases still to be met with, ought to make brandy, whisky, and gin rigidly taboo with all women. Even wine should be taken but sparingly and only with meals.

When we come to the question of prevention with men, we are brought face to face with the all but universal custom of whisky drinking, which, in the vast majority of cases, appears to have no evil results. It is this custom which renders escape for those predisposed to the disease exceedingly difficult and improbable; and it is here that some indication on which to found medical advice is so greatly wanted. In the hope of contributing something to this important question I venture to put forward one or two points which have occurred to me in the course of long study of these cases.

The predominance of the narcotic over the stimulant effect of alcohol is, I believe, of very great diagnostic value, and, where observed, should at once be brought to the notice of the medical adviser. It is to be feared, however, that it can be seen only as the result of what may be regarded as an overdose; and this, again, may indicate some advance of the neurosis. In any case it should be held as a most urgent danger signal, calling for prompt measures to safeguard the individual from the poison which is thus

made manifest. Whether such measures shall be under the head of prevention or of cure must be determined by the history of the case.

There is a certain characteristic nervous temperament which seems always to go along with this disease in men, and might, perhaps, be taken as indicating a predisposition in that direction. It may, for want of a better term, be designated the feminine type of man, partaking, as it does, of some of the most lovable and estimable qualities of woman, softening and refining the hard asperities of the male animal. It is a generally-accepted fact that it is "the best of men who go wrong" in this way—fine, genial, warm-hearted fellows, favourites with everyone, and "nobody's enemy but their own." I believe all so constituted would be well advised to be very cautious in their use of alcohol, and to be specially on their guard against its soothing and narcotic effect.

The one certain premonitory indication we have to go upon is heredity. When this is known to exist in any marked degree it is almost criminal not to use the strictest precautions. This, however, is so generally recognised, and the lamentable example of parental infirmity is in itself so impressive, that there is no need to add further warning.

It is scarcely necessary to point out the extreme impropriety of giving alcohol to young persons, who are very liable to acquire the habit, if not the disease, of alcoholism. The danger may be held to be in inverse ratio to the years of life.

We have now to consider the very important question of the precautions which ought to be observed by and for the protection of those who, there is reason to believe, are in danger of the alcohol neurosis. Absolute safety is, of course, to be found, and perhaps to be found only, in total abstinence from spirituous liquors; and where this can be carried out it is certainly the wisest course. The difficulty here is that a certain singularity and suggestion of weakness, which attaches to declared teetotalism—born perhaps of the extravagant utterances and assumptions of some of its advocates—along with exclusion from much that is attractive in the social life of this country, are specially repugnant to men of the temperament above referred to. Something short of this if less absolute in its protection might be found so much more generally acceptable as to be more effective in lessening the danger. Without going so far as to say that there is no risk to such persons in the lighter drinks, I venture to suggest that the real head and front of the offending rests with whisky, brandy, gin, etc., and that without these

the danger would be reduced to a minimum. It is a significant and frequently commented on fact that there is much less apparent drunkenness in continental countries, where light wine and beer are the prevailing beverages, and even in England, where beer and cider are so much in use, than in whisky-drinking Scotland. It will, I believe, be found also that, so far as alcoholism of the form we are discussing does prevail in those countries, it is the strong liquors—absinthe, brandy, whisky, etc.—which are taken. No doubt a man may get drunk on beer, but that is the deliberate and vicious form of intemperance with which we are not at present concerned.

If temperance reformers, backed by the medical profession, would concentrate their forces in an attack upon the strong drinks, and even encourage the use of beer and wine, I am convinced a great reform might be effected. While in full sympathy with the temperance movement, and freely acknowledging great benefit in individual cases, I believe that would-be reformers might as well try to stem the flow of a river as to stop all use of alcoholic beverages. They may dip any number of pitchersful and pour them into their teetotal tub as showing the amount saved, but the current will flow on in supreme indifference to the removal of such dribblets from its bulk. If, however, they were to recognise the natural tendency of the stream, and provide for it a safer course than that which it has dug out for itself, a considerable portion, and perhaps the entire portion now under consideration, might be induced to flow through it and so avoid the dangers now encountered. In plain terms, a society pledged to abstain absolutely from the strong drinks, but free to join socially in the use of beer and wine, would be supported by hundreds for one who will take the pledge of total abstinence; and, if it did not confer absolute security, would certainly go a long way towards it.

The same argument holds good with regard to legislative restriction of the sale of spirituous liquors. It is utterly futile to try to get the public to consent to total prohibition, even locally; and merely to limit the facilities for obtaining such "refreshment," whatever restraint it may be supposed to put upon the occasional "drunk," would have no effect in guarding against the disease. I cannot but think, however, that if this special danger from the strong drinks were recognised, and a combined attack upon *them* were made by all temperance societies and reformers to have them classed as poisons under the *Sale of Poisons Act*, sufficient pressure might be brought to bear to force

Parliament to take action. It might be sufficient simply further to limit the strength of spirituous liquor exposed for public sale to that of beer and wine, which would meet all legitimate requirements of a stimulating beverage, and would interfere less with vested interests than would special prohibition. In these days of compulsory sanitation under the Public Health Act, when strong measures are employed in the attempt to stamp out the obscure and mysterious germs of typhus, enteric and scarlet fevers, diphtheria, cholera, smallpox, etc., it would, one would think, be no great stretch of legislative interference with the liberty of the subject to deal drastically with this perfectly well-known and tangible poison, which, in its continual and general action over the whole country, probably destroys, and wrecks worse than death, more lives than all these other diseases put together. Of the 99 per cent. already referred to as using alcohol with impunity, probably no more than, say, 19 per cent. use it in the form of the strong drinks in question; and these would certainly not be the worse for having to confine themselves to the lighter and safer beverages. If the 80 per cent. were to join in a crusade against the strong drinks, even "the trade" might be powerless to resist its force. I would not, however, count all the whisky drinkers among the opponents of such a movement. These may, themselves, be safe enough, and feel secure in their superior virtue of self-control; but can they feel equally secure in regard to those who are far more to them than any personal gratification they may derive from their favourite tippie? May not the poison find some vulnerable spot in the family circle, and exact a terrible price for any pleasure it may afford—a favourite son, a beloved wife, or even a young and beautiful daughter suffering from nervous headache or other ache which "nothing relieves so quickly as a little whisky or brandy?" Who that is blessed with a young family can hold himself secure against such a calamity? Let this question be answered from the histories of families within the personal acquaintance of the reader.

A tentative measure which might be of considerable efficacy with a certain class of the community, and tend to change for the better the drinking custom of the country, would be to limit the publican licence to the lighter liquors, which would fully serve the purpose of legitimate refreshment. The indiscriminate and virulent animosity to "the trade" which seems to animate some intemperate temperance reformers, seeking to deprive tradesmen of their means of livelihood, tends to alienate,

even from the cause of temperance, public sympathy and support; and legislation along such lines is probably impossible. But a measure simply further limiting the strength of the liquor sold, so as to bring it within the range of comparative safety, while leaving the trade to the ordinary regulating force of supply and demand, might meet with general approval; and even extremists might accept it *pro tanto* as "better half a loaf than no bread."

Cure.—For those in whom the alcohol neurosis is established there is no remedy without *total abstinence for life* from alcohol. Moderation in the use of such drinks is impossible, as alcohol taken in any quantity fixes at once upon the morbid condition in the nervous system, causing an after-effect of depression and irritability, with a craving for more and more, soon getting beyond the power of moderate quantity or lighter drinks to relieve it. Not only the patient but also all friends and relations must be fully impressed with the fact that, to him, alcohol is a deadly poison, to be shunned as one would the plague. All question of *excess* or of moral delinquency must be put aside and our counsel based entirely on physical and medical grounds. The victims of this disease are, to begin with at all events, peculiarly sensitive to the charge of moral or mental weakness, and resent any suggestion that they are not as capable as others of taking care of themselves when they make up their minds to do so, as they are always ready to promise in the early stages. When remonstrated with they may admit having taken rather too much that time, but they have had a lesson and will be careful not to *exceed* in future. From the popular, and, as they regard it, moral point of view, they are entitled to take up this position. In their own and public opinion the sin is only in taking *too much*, which they honestly mean to avoid; whereas the physical fact is that the too much follows inevitably upon the moderate one glass. It is the first glass that does the mischief and is the sin, if sin there be. After that it may be said that moral responsibility ceases, the narcotised brain being incapable of controlling the craving for relief which is set up.

To enable total abstinence to be maintained amid the numerous opportunities and temptations of social life, something more than personal resolution is necessary. Periods of nervous depression and consequent craving will come round, taxing mental resolve to the utmost; and if, added to this, there is the usual pressure from without to "have a drink," accompanied probably by chaff

and banter if he hold back; or, in the case of a lady, that she is looking very ill and must have a glass of wine or a little spirit, the frail barrier is sure to be broken down. Were public opinion sufficiently educated in this matter, and the danger realised on both sides, it would be different; but so long as the constitutional disease is confused with the vice of drunkenness, and regarded with shame on the one side and blame on the other as *over-indulgence in a taste* for alcohol, there cannot be the mutual confidence and co-operation necessary to resist its ravages. Fortunately the sacredness and binding quality of a pledge are universally acknowledged, and may be brought to bear with the greatest benefit in such cases. The tectotal pledge openly taken and frankly acknowledged at once and effectively shuts the door against pressure or offer of stimulants in respectable society, such being regarded as insulting to the honour and moral integrity of the pledged, and at the same time adds a moral restraint to the intelligent resolution of the patient. We cannot, therefore, too strongly urge the necessity for this protection in all cases of confirmed or even threatening constitutional inebriety, by joining the Good Templar Society and wearing the blue ribbon, or other equally open acknowledgment before the public.

Homes for Inebriates.—In the course of the disease the brain and, with it, the moral sense and will power may have become so weakened that no dependence can be placed in self-control under the ordinary opportunities and suggestions of everyday life; and complete seclusion for a time from all such becomes imperative. There are, in various parts of the country, “Homes” and “Retreats” which profess to deal with these cases, and which, if properly conducted, should be of immense benefit in tiding over this helpless stage of recovery. There is reason to fear, however, that some are not conducted on lines which can be thus commended, being rather in the nature of asylums for the *care* of inebriates than of hospitals, as they ought to be, for the treatment and cure of the disease. It ought to go without saying that alcohol and opium should be entirely excluded from these institutions, and unobtainable for as many miles as possible round about. It must ever be kept in mind that the disease is the direct effect of a narcotic *poison* taken into the system; and that, although irreparable mischief may have been done, further progress may be checked, and the recurring attacks of craving be rendered less and less severe by entire withdrawal of the poison. Such is the *raison d'être* of these institutions; and I hold that none should

be licensed for the purpose in which total abstinence from alcohol is not fully carried out. It is, I am convinced, a complete fallacy to suppose that the withdrawal should be gradual—that the poison should be continued in diminishing quantities, rather than at once to face the ordeal of dealing physiologically and medically with the actual condition of weakness and depression to which the nervous system has been reduced. This is only to put off, if not to shirk, the day of battle in dealing with the *craving* which must be grappled with and overcome before the curative process can be entered upon. According to the general rule in medicine, first, when possible, to remove the cause, the first step in dealing with this disease is at once and for all time to withhold alcohol, and trust to nutrient and therapeutic means to maintain the strength. Any strength which appears to be obtained from alcohol is of a false or very evanescent character, like the flame from pouring spirit upon an exhausted fire, while the poison continues its weakening effect upon the nervous system.

The above argument holds good also with regard to treatment during an acute attack of alcoholism, when the question arises between the immediate and the gradual withdrawal of alcohol. The sooner we can get rid of the poison the more strength we shall have to go upon in promoting recovery; therefore the safer and more rational course is to stop the drink at once. The great difficulty, however, is in carrying it out except in a hospital or with an efficient nursing staff at home. When the patient awakens up to the horror of his condition, nothing but the strongest coercive measures will restrain him from getting relief from any possible source. To prevent this seems to him, and to attendant friends, very cruel, and it is almost impossible to resist his and their entreaties; but, like a surgical operation, it saves him from much greater suffering in the long run. It is true that the immediate result may be to precipitate an attack of delirium tremens; but, even if so, it is only anticipating by a few hours the inevitable nervous collapse. The debility of delirium tremens is there, and is only being temporarily bolstered up by the stimulant, while the morbid action is being fed. There is, I believe, no additional danger from the sudden withdrawal, but the reverse. Instead of, as some seem to think, accelerating, it stays the debilitating process, by removing the poison which is causing it. If, on the other hand, the drink supply be continued, and the attack allowed to run its full course, the climax is, usually, rank rebellion on the part of the stomach, which positively refuses to retain another

drop of the vile stuff. The state of prostration is then pitiable in the extreme, but the worst is past. The craving is gone and the patient is submissive to the means used for his recovery.

In all dealings with these cases it is, above all, necessary to gain the good-will of the patient, and to induce him to co-operate with us in our efforts to save him from an impending fate. He must be got fully to realise his condition, to recognise it as a disease, and to wish to be cured. It is hopeless to look for any good results in the face of personal antagonism and scheming to circumvent the measures taken for his benefit. Such an attitude is apt to arise from the moral preachings to which he has been subjected, and from the stigma of sin and disgrace usually attaching to his conduct. The effect of this, along with an inward consciousness of inability to resist the craving when it comes, is too often to engender a "devil-may-care" spirit and surrender to his fate. "If I am to go to hell," he says, "let me go pleasantly and enjoy myself while I can." "A short life and a merry one" is his motto, although there is but little merriment—only a dull negative enjoyment or welcome oblivion in his intoxication. Our object must be to keep in the background the moral element in the case, to speak of and treat it entirely on medical lines, and to inspire the patients with the desire for and hope of getting well and strong by banishing the *materies morbi* out of their lives. Some degree of recovery is possible at any stage; but the duration and severity of the disease have an important bearing on the probability of the necessary conditions being carried out. The brain may be so damaged and the mind so weakened that no co-operation is available, and the case to be dealt with is more or less one of insanity, requiring permanent coercive measures of restraint. With such cases our lunatic asylums are largely filled, presenting a terrible tale of preventable wreckage of human life.

A SUMMARY OF RECENT WORK ON VITAMINES.*

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BOTH experimental and clinical proof has been adduced of the fact that certain food-stuffs contain hitherto unrecognised substances of outstanding importance; for if these substances are absent from the diet, certain serious and even fatal diseases are brought about. These substances are known as vitamins, and the diseases caused by their absence are usually grouped under the name of "Deficiency Diseases." It is therefore no longer sufficient in dietetics to consider merely proteids, carbohydrates, and fats, for a diet may contain these in satisfactory amount and may yield a sufficient caloric value, but if it lacks vitamins, definite diseases will follow.

The deficiency diseases comprise beriberi, scurvy and its congeners, pellagra, and possibly also rickets, tetany, osteomalacia, and sprue.

Beriberi.—Our knowledge regarding vitamins owes its origin to the investigations made on beriberi. The etiology of this disease long remained an unsolved problem. It was looked upon as an infective disease or as a form of intoxication. Fully thirty years ago, however, the suspicion was aroused that some close relationship existed between beriberi and the extensive use of rice as an article of diet. The disease is widely met with in Japan, the Malay Peninsula, and the Philippines, where rice forms the staple article of diet with many of the inhabitants.

The clinical features of beriberi are well known, the most important being cardiac weakness, emaciation, œdema, various paralyses, and muscular atrophies, and, above all, a neuritis affecting especially the extremities, but also showing a tendency to implicate the vagus and the phrenics.

In 1896, as the result of numerous observations made in Japanese prisons, the view was put forward by Vordermann that beriberi occurred after the long-continued use of highly milled rice (polished rice). In this process of milling the peripheral layers of the grain or pericarp are artificially removed. This view soon received ample confirmation, and the further important fact was established that persons who made use of unpolished or

* Delivered to the students attending Professor Russell's Lectures on Dietetics.

cured rice (which retain the pericarp) were exempt from the disease. Attention being thus focussed on the importance of rice in the etiology of beriberi, experiments were made by Eykman¹ in order to try to produce the disease in fowls. The birds were fed on polished rice. They lost weight and were attacked by a neuritis (polynneuritis gallinarum). This only occurred if the rice was polished, not if the whole rice-grain was employed. The addition of pericarp or rice-polishings (which are removed in the process of milling) to the diet prevented the outbreak of the disease, and it was further shown that an aqueous extract of rice-polishings could cure the disease (Fraser and Stanton²). The disease thus produced in fowls was identical with beriberi as occurring in man. It became clear from these observations that the removal of the pericarpal layers of the rice-grain by milling was accompanied by the loss of some substance, the presence of which prevented the onset of beriberi. The attempt was now made to isolate this substance and to determine its physical and chemical characters. The value of the work of Casimir Funk³ in this connection cannot be too strongly emphasised, and in the preparation of this lecture his contributions to the literature of the subject have been freely consulted and employed. He carried out complicated chemical investigations on rice-polishings, and finally succeeded in isolating a substance occurring as colourless, needle-shaped crystals, with a melting point of 233° C., which showed marked curative properties in experimental beriberi. This is "beriberi vitamine." It is a nitrogenous substance and is soluble in alcohol. It appears to be a pyrimidine base, and probably exists in food as a constituent of nucleic acid (Vedder⁴).

As a result of this valuable work, the prevention and cure of beriberi came to rest for the first time on a scientific basis. Funk's vitamine has been proved to be the most powerful and rapid remedy we possess in beriberi. It is present in food in such minute quantities that simple dietetic treatment of the disease brings about recovery very slowly, and the difficulty of obtaining isolated vitamine, together with its expense, make its general use at present impossible. It is hoped that it may prove possible to produce Funk's vitamine synthetically. Further investigations were made on other substances in order to try to isolate vitamines. Yeast, which was known to be curative in the polynneuritis of fowls, was first successfully tested. Milk, yolk of egg, meat, wheat, oats and barley have been shown to

contain vitamins. In connection with meat, reference may be made to the fact that Takaki⁵ was able to reduce very materially the incidence of beriberi in the Japanese Navy by adding meat to the diet. Vitamins are widely distributed in animal and vegetable life. Fresh growing plants, potatoes, juicy fruits, and vegetables are rich in what is known as "scurvy vitamin." Dried corn, on the other hand, contains only "beriberi vitamin," but if this dried corn begins to germinate, "scurvy vitamin" is also found in it. Juicy fruits and vegetables lose their vitamin (scurvy vitamin) entirely on drying or on heating to 100° C. for an hour. Beriberi vitamin resists drying and is also more resistant to heat.

As has been said, vitamins probably exist in nature in complex combinations, and are only set free in the body. How they act is quite unknown, but as such minute quantities of them produce powerful effects (the quantity obtained per kilo of rice is about 0.1 gm.), it has been supposed that their action is similar to that of hormones and the secretions of ductless glands. It is known that certain albuminous substances vary widely in their nutritive value, this variation depending on the presence or absence of certain amino-acids. Similarly the value of certain substances as foods seems to depend in a considerable degree on their vitamin content.

The Scurvy Groups of Diseases.—The next diseases which fall to be considered are scurvy and its allies, experimental scurvy in animals, "ship beriberi," and infantile scurvy or Barlow's disease.

It is generally conceded that scurvy has a close relationship with diet. It occurs when a diet is taken consisting exclusively of dried vegetables, sterilised tinned meats, bread, and starches. It has long been known that lime-juice, fresh vegetables, and fresh fruit quickly cure the disease.

The clinical picture of scurvy comprises swelling and ulceration of the gums, diffuse painful swellings in the limbs, subperiosteal hemorrhages, cardiac weakness, and emaciation. To these may be added hæmaturia and blood-stained effusions into the serous sacs. Holst and Fröhlich⁶ showed by experiment that animals fed on a diet corresponding to that which produced scurvy in man were attacked by a very similar if not identical disease. They constantly exhibited hæmorrhages in the gums and ulceration, loosening of the teeth, hæmorrhages into the soft parts round the knee-joint and under the periosteum of the ribs. In some cases a polyneuritis occurred, *i.e.* symptoms of beriberi in addition.

Now, these symptoms did not occur if the animals were fed, in addition, on cabbages or carrots or other substances known to possess anti-scorbutic properties. The different food-stuffs which possess this curative property vary very much in the stability of the anti-scorbutic substance (vitamine) which they contain. This seems to depend largely on the reaction of the juice; the higher the acidity, the greater is the stability of the substance. Lime-juice, for example, is highly acid, and can be heated to 110° C. for an hour without losing its anti-scorbutic action; and the power of resistance of cabbage to heat can be enhanced by the addition of acid. Generally speaking, anti-scorbutics when cooked act much more feebly than in the raw state; heating to 120° C. for a brief period is harmful, and drying is quite as harmful as heating. Lime-juice has been investigated by Funk in order to determine if substances corresponding to vitamins could be detected. Certain nitrogenous substances have been isolated, and the presence of a substance possessing anti-neuritic properties has been proved.

The relationship of scurvy to beriberi is very close. In this connection Funk instances the siege of Paris, when cases of scurvy were caused by a diet of polished rice.

In some animals this food produces scurvy, in others (as we have seen) beriberi, and in others a mixture of the two. Further, cases of scurvy have been described in man with symptoms of neuritis. Despite these facts, it is almost certain that the two diseases are quite distinct, and are caused by the absence of different substances from the diet. The so-called "beriberi vitamine" is much more stable than "scurvy vitamine"; it resists heat and drying better, and, moreover, substances which prevent beriberi, such as yeast, oats, and barley, have no effect on scurvy. Although the explanation of the fact is obscure, it seems probable that a diet containing "scurvy vitamine" alone prevents both scurvy and beriberi, whereas a diet containing only "beriberi vitamine" only prevents beriberi.

Ship beriberi.—This disease is probably identical with scurvy, and does not require separate consideration.

Infantile Scurvy (Barlow's Disease).—This is an affection which occurs almost exclusively among children who are fed on sterilised milk or commercial preparations of starch. It is probable that it is identical with scurvy as met with in adults. The pathological changes are practically the same, and monkeys fed on condensed milk showed scorbutic lesions which were the same in both young and adult animals.

Neumann⁷ showed that children fed with milk heated for a quarter of an hour in Soxhlet's apparatus suffered from infantile scurvy. He believed, probably erroneously, that toxic substances were produced in the process of heating which caused the disease. The children quickly recovered if given lime-juice, fresh milk, or fruit juice. The reports regarding the production of infantile scurvy by a diet of sterilised milk are very conflicting. Some explain the variable results by assuming that where a negative result was recorded, the necessary vitamine was obtained from some other source.

Milk has been proved to contain vitamine, but the amount present in different samples varies widely; in some it is practically absent. It is of the highest practical importance to determine how far this substance in milk is affected by heat, and large numbers of experiments have been made in the attempt to solve this question. Gerlach⁸ found that calves fed with scalded cow's milk did not thrive so well as on fresh milk; completely sterilised milk had a definitely harmful effect; pasteurised milk, however, appeared as good as fresh milk. The present theory, then, ascribes infantile scurvy to the absence of the vitamins normally present in milk (the vitamins having been destroyed during sterilisation), or to a completely unsuitable diet of starches which contain no vitamins.

Pellagra.—This is a disease which is met with in places where maize is the chief article of diet, especially North Italy, the Tyrol, and parts of North America. It consists of an erythematous rash, stomatitis, gastro-intestinal disturbances, and degenerative changes in the central nervous system. It occurs in acute or chronic form, depending (as Funk has shown) on whether the maize has been hand-milled or milled by machinery. In the former case we get a chronic, less severe form of the disease; in the latter, acute and rapidly fatal cases, probably because the vitamine of the maize is more completely removed.

Several hypotheses have been put forward in regard to pellagra. There is the so-called intoxication hypothesis, which supposes that certain forms of penicillium and aspergillus, which are constantly present in diseased maize, produce toxic substances which cause the disease. There is also an hypothesis of auto-intoxication from the gastro-intestinal tract, and an hypothesis of bacterial or protozoal infection.

The most recent hypothesis is that pellagra is caused by a diet lacking in vitamins. This can only be proved by showing

that the addition of food containing vitamins to the diet is able to cure the disease. So far it has not been found possible to produce pellagra experimentally in animals. Certain symptoms are indeed produced in animals by feeding them with maize, but they do not resemble the symptoms of pellagra as met with in man. Chemical investigation has shown that vitamins occur in maize in very similar fashion to rice; that is, in the peripheral layers.

Funk summarises the points in favour of this view as follows:—

1. Pellagra is endemic only where maize is much eaten.
2. It appears in a given district with the cultivation of maize, and disappears if the maize is given up and replaced by some other grain.
3. Change of diet—a diet containing vitamins—is the best curative measure.
4. Pellagra occurs most frequently in country districts; in towns a change of diet and cheap animal food (which contains vitamins) are more easily obtained.
5. The similarity of pellagra to other deficiency diseases; for example, scorbutic changes are found in pellagra, such as stomatitis, swelling and ulceration of the gums, and superficial ecchymoses.

It seems, then, that the polishing of maize is harmful and should be abandoned, as important substances are thereby lost.

Rickets and Tetany.—Rickets and tetany may conveniently be discussed together. Rickets is a disease which is the result of an insufficient diet. Insanitary surroundings and want of fresh air do not produce the disease, as it is met with under the very best hygienic conditions. Several other hypotheses regarding rickets are not entirely satisfactory, such as the hypothesis of deficiency in lime salts or disturbed assimilation of them, or, again, the hypothesis which supposes the disease to be due to a lack of sufficient proteids and fats in the diet. The hypothesis which I wish to bring to your notice is that rickets occurs when certain substances, probably vitamins, which are necessary for normal metabolism are absent from the diet. It seems probable that these substances are necessary for the proper action of the thymus and the parathyroids, and that their absence leads to diminished function of these glands, and thereby to rickets and tetany. It is known that operative removal of the parathyroids leads to tetany, and also that extirpation of the thymus is followed by disturbance

of the growth of bone and by defective assimilation of lime salts.

This hypothesis, that rickets is due to a want of vitamins in the diet, rests mainly on the discovery of vitamins in milk, and also on the fact that the vitamin content of milk varies within wide limits.

Points which seem to favour this hypothesis are (Funk):—

1. Rickets is less frequent and milder in breast-fed children. Healthy breast milk always contains vitamins.

2. Breast feeding has a favourable effect on rickety children.

3. The nourishment of nursing women is often totally inadequate, and this may lead to deficiency of vitamins in their milk.

4. During the winter months the food supply of cows is often inferior, this leading to an inferior quality of milk.

5. The harmful effect produced on the vitamins of milk by prolonged boiling.

6. The harmful results of feeding children with starchy foods, which are poor in vitamins.

7. The beneficial effect of cod-liver oil, which contains vitamins, and also apparently a substance which aids the metabolism of lime salts in rickety children.

Vitamins in their Relation to Growth.—It has been shown that certain foods, e.g. milk and butter, contain a substance which stimulates the growth of young animals.

A diet amply sufficient for adult animals may be quite insufficient for young growing animals, and it is possible to produce cessation of growth in the latter by a vitamin-free diet. The substance which excites growth is probably a vitamin.

An important problem here presents itself; for if vitamins are capable of stimulating normal growth, may they not also stimulate abnormal growth, that is, tumour formation? Those who hold this view believe that the growth of tumours is regulated by a chemical substance.

Briefly, the theory is that the substance exciting growth in the young has no function in adult life, and is broken down. Since this substance, being a vitamin, belongs to the nuclein group, it is possible that in the period of life when nuclein metabolism becomes less active it is not broken down, but stimulates certain cells to growth. The practical question arises whether it would be possible to check tumour growth by eliminating from the diet this substance which excites growth.

There are one or two other points in connection with vitamins which demand brief notice. It is said that in severe infective conditions, such as typhoid, a purely starchy diet is dangerous and leads to anorexia, cardiac weakness, and sometimes even to nerve degeneration. Now, enthusiasts for the vitamin theory hold that those symptoms should not be looked upon as the sequel of the infection, but as symptoms of beriberi. The same applies to post-operative cases; and in all it is emphasised that a diet rich in vitamins should be given as soon as possible. It is further stated that loss of appetite is an important early symptom of "vitamin hunger," and is of special significance when occurring in children, in chlorosis, and in convalescence. A diet poor in vitamins may lead to severe gastro-intestinal disturbances—vomiting, diarrhoea, and meteorism—and it is a well-known clinical fact that nervous dyspeptics often treat themselves with a diet poor in vitamins with serious results. Lastly, you have all heard of the oatmeal treatment of diabetes, the introduction of which we owe to von Noorden of Vienna. There is no doubt that in certain cases this method of treatment is extremely beneficial, but the mode of its action is quite unknown. It is now suggested that the favourable results depend in some way on the presence of a substance of vitamin type in oatmeal, and possibly in the future an explanation may be forthcoming along these lines. In any case the relation of vitamins to disease is likely to become a factor of increasing importance in dietetics, and it is right that you should know something of the part which is played by vitamins in certain affections and of their possible relation to others, as well as of the lines along which investigations are being made.

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NOTE ON A CASE OF HUNTER'S FREEMARTIN, WHERE
THERE WAS REVERSION TO THE WILD PARK
CATTLE TYPE.

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RECENTLY through the kindness of the late Dr. David Brown of Muirhouse, Stow, I learned that he had at his farm there a specimen of freemartin, and through his great kindness I saw it alive, and was also able to be present when it was slaughtered at Edinburgh and to secure the parts necessary for special examination.

Description of the Living Animal.—When the animal was seen at Muirhouse the following points were noted:—"The mother of the freemartin was a normal shorthorn, the co-twin of the freemartin a normal and potent bull, afterwards castrated.

"The freemartin itself was two years old, white in colour, and being fattened for market. It had been noted that the animal was sterile and did not stand to the bull, and it was this fact that elicited its history from the cattleman in charge.

"The horns are slender, curved somewhat forward and in, not straight as in the bull, and less curved and finer than in the cow (Fig. 1). The *face* is narrow transversely in the lower part, with a long and straight profile. In *gait* the animal stands high. The *neck* is thickish as in the bull, with a slight crest, smaller than in the bull but more marked than in the cow. The *body* is less massive than in the cow.

"The *external genitals* are those of a heifer, but smaller, so that the vulva is somewhat contracted. In the mammary system there are four small teats with a pediculated excrescence attached to one. No signs of mammary tissue and no udders."

When, however, I saw the animal at the Edinburgh slaughterhouse with Mr. James Henderson, M.R.C.V.S., he pointed out to me that it resembled the wild park cattle in having a white hide, black muzzle, black hoofs, blackish spots on the legs, and great timidity. This reversion in a freemartin was evidently a condition of great rarity and importance, and I know of no such case in literature, although Mr. Henderson thinks he has seen it as frequently as 1 in 300 in single cases.

What the Freemartin is.—Hunter's freemartin is a sterile, genitally malformed bull, with small undescended testes and rudimentary epididymes, vasa deferentia, and Müllerian elements. Vesiculae seminales are present.

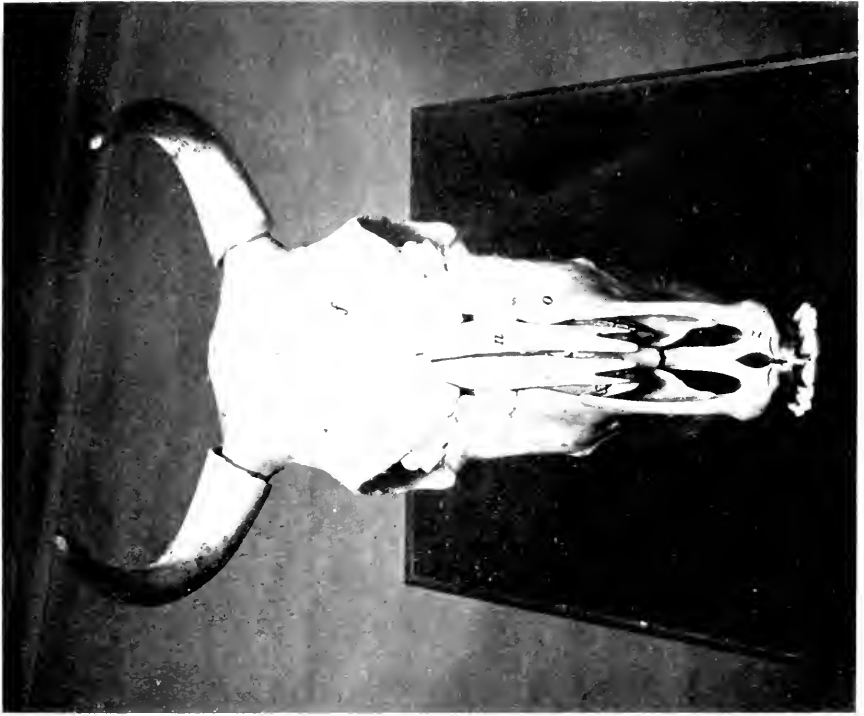


FIG. 2. Skull of Freemartin. Frontal bone; 1 nasal bone; 2 upper jaw bone; 3 hind jaw bone.



FIG. 1. Head of Freemartin showing Reversion to Wild Park Type.

The *external genitals* consist of labia majora, clitoris, and the urinogenital sinus element (one inch in length) of the vagina.

The potent bull-calf and the freemartin are produced from one zygote (fertilised ovum), but the freemartin has allotted to it the hydatid testis and prostatic utricle given to the single bull, usually the result of one zygote, and this gives it the exaggerated simulacrum of the female genital tract. (See Fig. 1 in the *Proceedings of the Edinburgh Royal Society*, vol. xxx.)

The Genital and Internal Secreting Organs in the Case.—From the slaughtered animal I obtained the internal genitals, skull, internal secreting organs—thyroid, thymus, suprarenals. The pituitary and pineal glands I was unable to remove owing to my wish to keep the skull intact. The skull is now in the Museum of the Royal College of Surgeons, Edinburgh. The internal secreting organs were found to be normal on microscopical examination; the internal and external genital organs were defective. Thus no sex glands could be found in the large masses of fat in the regions of the *broad ligaments*. No actual rudimentary cornua were discovered, and indeed the only part of the internal genitals represented was the urinogenital sinus and the epididymes; the external genitals of a female type were present as already detailed.

This fatty degeneration of the internal genitalia is often seen in freemartins, and was present in many of Numan's cases, although not evident in the drawings published by Hunter. The animal under consideration was thus for the greater part of its life sexless, but I have little doubt that small undescended testes were present at one time.

The Skull.—The skull was carefully examined but no points could be detected in which it differed from the normal cow's cranium and jaws. It is quite possible, however, that this may not hold good for all cases of freemartin, inasmuch as the animal under consideration differs from the former in showing marked reversion, and thus by such a variation might have some compensation in the skull shape. It must be remembered, however, that it had a modified crest like the bull's, but less marked.

The Reversion in this Case.—The chief peculiarity of this case is the fact that it resembled the wild park cattle. These are probably pure white varieties descended, according to some authorities, from the primitive aurochs, and, as is well known, exist still in some parts of Scotland and England (Hamilton Park, Chillingham, etc.). The subject of wild park cattle is fully discussed by Hedger Wallace, and Lyddeker, and the former holds that the wild park type is

derived from animals brought over by the Romans, and summarises his views as follows (*op. cit.*, p. 259):—

“1. The ox common and universal throughout Britain, and, we may add, Ireland, at the time of the Roman Conquest was the Celtic shorthorn, the *Bos longifrons* of Owen.

“2. This animal was small and dark coloured, and such we find to be the existing type of animal in the regions to which the Celts were ultimately driven and confined.

“3. At the time of the Conquest the gigantic ox, *Bos primigenius*, was extinct in Britain, while the Celts had domesticated the *Bos longifrons*, the Celtic shorthorn.

“4. This animal was utilised and consumed both by the Celts and Romans.

“5. The Romans, for draught and ploughing, preferred dark-coloured oxen. For religious rites and ceremonies, public and private, white oxen were necessary.

“6. These white oxen were to be found in various provinces and colonies of ancient Rome as domesticated breeds, and the descendants of these cattle are to be found within the same areas to-day practically unchanged, when we compare them with the representatives of their ancestors on wall-paintings, sculptures, coins, and gems.

“7. That such cattle, carrying with them the prestige of sacrificial animals, admired, selected, and preserved, were brought into Britain we know from the Roman middens. Their size and the erect lyre-shaped form of their horns when compared with the native Celtic shorthorn admit of no mistake.”

The Reversion in this Case.—The special case considered was thus a freemartin with reversion to the wild park type.

By “reversion” we mean the presence of ancestral traits in varying amounts not present in the majority of the species to which the animal belongs. In the animal under consideration the reversion was expressed in the hide, horns, hoofs, muzzle, and nervous system. It is worthy of note that these are all derived from the outer germinal layer, and therefore this variation may be described as *pure ectodermic reversion*.

Before going on to the question of the mechanism of this reversion an interesting question must be discussed, viz.:—

Is there a Choice of Two Gametes on Each Side at Fertilisation, or is there only One on Each Side?—The usual belief is that at fertilisation a single gamete is requisite on each side, the male gamete or spermatozoon, and the female gamete or oocyte, each

with half the chromosomes of the primitive sperm and germ cell. There are, however, serious difficulties in connection with the single gamete view. The result of fertilisation is, as a rule, a typical male or female organism, and thus we have to explain how what leads to either of these is retained, and those of the opposite *sex-ensemble* lost.

In the male and female gamete in mammals there are no determinants for "sex." Sex means a certain form of sex-gland into which the primitive germ or sperm cells migrate after their derivation from an early division of the zygote. The male and female gametes differ in their Wolffian determinants, *i.e.* the female gamete has none permanent but those for the epöphoron, while the male gamete has certain Wolffian tubule determinants which go to the formation of the testis tubules. It is this difference that makes the sex-gland an ovary or testis as the case may be, and therefore sex follows from the nature of the Wolffian determinants, *i.e.* prior to fertilisation. With only one gamete on each side there would necessarily be double Wolffian determinants, and the question would arise as to how one or other got lost. The same difficulty would arise in cases of sex-limited cases of diseases, such as hæmophilia, where the mother has no hæmophilia yet transmits it to a son.

If, however, we suppose there are two gametes on each side, we get a feasible explanation of many phenomena. If we have a Wolffian and non-Wolffian gamete on each side, and if the male Wolffian gamete and female non-Wolffian gamete unite to give a zygote, then this zygote is male. On the other hand the union of a Wolffian female gamete and non-Wolffian male would give a female zygote. One thus avoids the Wolffian determinants in each gamete when there is no choice of two, and therefore a loss of the male or female Wolffian determinants is unnecessary.

Thus in a sex-limited disease such as hæmophilia we can suppose the factor to be a loss of some clotting ferment in the maternal non-Wolffian gamete. I hope to discuss this more fully on another occasion, but this will serve for the present purpose.

Mechanism of this Reversion.—The changes producing this reversion took place at maturation, *i.e.* when the polar bodies were ejected prior to the formation of a single zygote. What happened at fertilisation and immediately afterwards may be conjectured as follows: on the one side there was a male gamete and on the other a female gamete (or ovum).

The male gamete was one of the two kinds, and contained.

inter alia, determinants for the part of the Wolffian body and tubules necessary for the formation of the somatic part of the testes. The female gamete contained no Wolffian determinants, and thus a male zygote would be formed by their union. The sperm cell, *i.e.* the heredity cell which became a gamete by the loss of the polar bodies, contained immediate and ancestral determinants, and so did the oocyte.

Prior to fertilisation the sperm cell threw off the polar bodies, and *these were the immediate species ones*. Thus the ancestral group in the main now formed the male fertilising gamete and contained the ectodermic group of the wild park type, usually thrown off. The oocyte lost the polar bodies too, but these were ancestral, and the immediate ones formed the fertilising female gamete. The zygote formed had in it an ectodermal group of determinants of an ancestral type, while there was also an immediate ectodermic group. From this one zygote there arose two zygotes by doubling of the determinants, but a doubling of the ectodermic group did not happen as there were already two groups of them.

After this doubling a segregation took place giving two zygotes, and in the zygote for the freemartin the ancestral ectodermic group was placed: in the potent co-twin bull the immediate ectodermic group, and thus the ordinary roan bull-calf.

At maturation (ejection of polar bodies) half the chromosomes are thrown off on each side. In the evolution of species we have a slow overmastering of ancestral traits by the immediate ones, due to intrinsic changes by maturation and by crossings. Normally, I suppose the chromosomes lost in polar ejection are those in the ancestral group, while the immediate ones are retained in the appropriate gamete.

In this special case then the ancestral ones were retained as above detailed, and thus the wild park cattle type of this freemartin.

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STUDIES FROM THE PATHOLOGICAL DEPARTMENT
OF THE UNIVERSITY OF EDINBURGH.

CASE III.

CASE OF TUBERCULOSIS INVOLVING THE HIP JOINT, BRONCHIAL
GLANDS, LUNGS, AND INTESTINES.

Day Book, 111.

Museum Book, 104, 105, 106, 107.

The patient was a boy, aged 9, who had been failing in health for over 3 years.

About March 1912 it was noticed that he was limping, and for this he was sent to a poorhouse hospital, where his leg was put in a plaster case. The plaster case was taken off by November, and the boy then went about with a patten under the other foot. At that time he had starting pains at night and his general health was getting worse.

He had previously enjoyed good health. When he was a year old he had diphtheria, but after that he remained quite well till he was 6 years old.

His father, who was a farm labourer, was not strong, and *his mother died of phthisis*.

The boy was admitted to the Children's Hospital on 28th December 1912. He was pale and his limbs were wasted. The left leg was flexed at the hip and somewhat abducted. There was a fluctuating swelling over the posterior aspect of the hip; the knee was flexed, and it gave pain to straighten it. The thighs were both wasted, but the left was $1\frac{1}{2}$ inches less in circumference than the right; the calves were of the same circumference.

There was marked lordosis, and the least movement of the left leg gave pain and caused the pelvis to rock.

The X-ray photograph showed extensive disease of the head of the bone and of the acetabulum.

The temperature began to swing up to 102° - 103° F. on 12th January and on the 16th an operation was performed. The abscess was emptied, the head and neck of the femur were removed, and the acetabulum and neighbouring bone, which showed extensive softening, were scraped till all the obviously diseased bone had been removed. A drainage tube was left in the wound.

Next day, the 17th, the boy had recovered wonderfully from the operation. There was much discharge from the wound.

On the 18th and 19th the temperature came down to normal, but on the 21st it began to swing again, reaching 102° - 103° F. at night. Though the wound was healing up there was progressive tuberculous

disease of the lung. Night sweating, cough, and wasting became more marked.

On 4th March the patient had a succession of "fits," and he became unconscious for a time. From this onwards he gradually sank, and died on 17th March 1913.

NOTES ON THE POST-MORTEM EXAMINATION.

The specimens are:—The upper portion of the left femur; liver; kidney; suprarenal; spleen; diaphragm; heart; larynx and trachea; mediastinal lymph glands; small and large intestine.

The wound of the operation had broken down and there was a sinus lined by tuberculous granulation tissue. This communicated with a large tuberculous cavity at the site of the joint. The upper end of the bone is rounded off and the surface (M. B., 107) shows irregular yellow and red mottling from congestion and exudation.

The compact bone of the shaft is much thinned, the marrow is red and congested, with paler degenerated areas, and a few minute yellow points, probably tubercles. The cartilage is unduly white and opaque, from necrosis.

The peritoneum showed acute suppurative peritonitis which had arisen from a perforated ulcer situated about 6 inches above the ileo-cæcal valve (Specimen—M. B., 106).

There were numerous tubercles over the *liver*, and there was roughening of the capsule from recent inflammatory exudate (Specimen—M. B., 107). The cut surface of the liver shows advanced fatty degeneration, and tubercles are to be seen situated in the portal areas. Some of these have the form of small cyst-like cavities with bile-stained caseous contents.

Microscopically the fatty degeneration is well seen, especially in the peripheral zone of the lobules; the droplets of fat are for the most part of large size; a few small tubercle follicles are seen scattered through the liver tissue and under the capsule.

The *spleen* (Specimen—M. B., 107) was markedly congested and rather soft. A few flat tubercles are to be seen in the capsule, and a few small pin-point yellow tubercles are visible in the pulp.

In a microscopic section many tubercles are visible, scattered through the pulp and under the capsule. These have a caseous centre with a few giant cells around their periphery. The intervening pulp is much congested, the endothelial cells of the sinuses are swollen, and many lie free in the sinuses.

The *kidney* (Specimen—M. B., 107) shows a pale fatty cortex, but there is no distinct evidence of tubercles.

The *suprarenal gland* is almost completely destroyed by caseous tubercles which have formed a large, firm yellow mass in the substance of the gland.



FIG. 1. Mediastinal Lymph Glands.
(a) Caseous calcified mass.



FIG. 2. Suprarenal Capsule.
(a) Large caseous tuberculous mass.

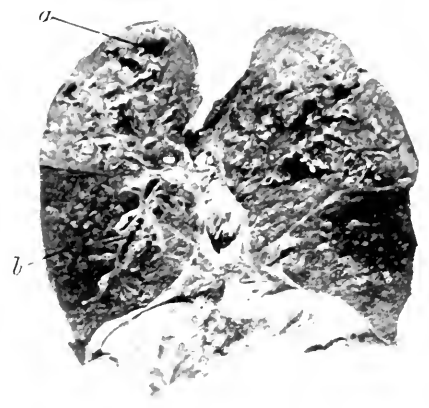


FIG. 3.—Lung.
(a) Tuberculous cavities in upper lobe.
(b) Areas of tuberculous consolidation in the lower lobe.



FIG. 4.—Larynx.
(a) Commencing tuberculous ulceration in the vocal cords.



FIG. 5.—Small Intestine.
(a) Tuberculous ulcers.

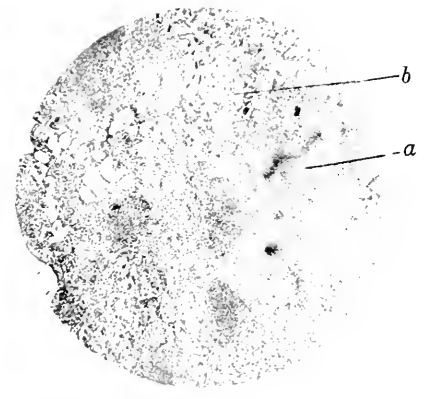


FIG. 6.—Microscopical Section of Lung (40 diam.).
(a) Caseous areas in tuberculous bronchopneumonia.
(b) Catarrhal changes in intervening alveoli.

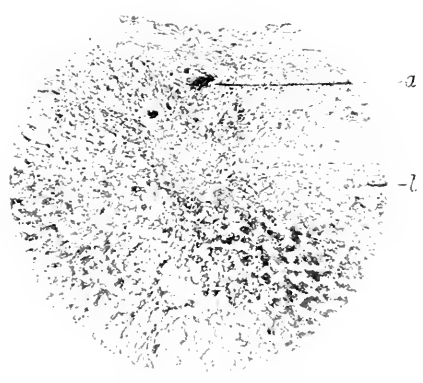


FIG. 7.—Liver (80 diam.).
(a) Small tubercle with giant cell under liver capsule.
(b) Advanced fatty degeneration in liver cells.



FIG. 8.—Spleen (40 diam.).
(a) Miliary areas of tuberculosis, caseo-cellular in character.

The *diaphragm* (Specimen—M. B., 107) shows in its serous covering the deposit of comparatively large round disc-shaped tubercles characteristic of tuberculous peritonitis of some standing.

The *heart* (Specimen—M. B., 107) was a little dilated. The muscle of the ventricle is pale and slightly mottled. There was no tuberculous pericarditis.

A chain of *mediastinal glands* (Specimen—M. B., 107) shows old calcified tubercle as well as small tubercles recently formed.

Microscopical sections of glands from different areas show tubercles of all ages, from a completely fibrosed nodule, and a nodule with caseous centre surrounded by dense fibrous tissue, down to recent small tubercles with central caseation and a few peripheral giant cells and little or no fibrous reaction around. The rest of the gland tissue is congested, and the gland sinuses contain many large phagocytic cells.

The *larynx* (Specimen—M. B., 107) shows early tuberculous ulceration of both vocal cords.

The mucous membrane of the *trachea* is uniformly congested, and a considerable number of scattered miliary tubercles, with commencing ulceration, may be seen, especially near the bifurcation.

Lungs.—There is old-standing fibrous pleurisy over the whole lung. The upper lobe is riddled with cavities, and what remains of the pulmonary tissue of this lobe has become, to a large extent, consolidated and caseated.

The lower lobe shows congestion and consolidation in small branching areas, indicating a bronchial or peribronchial distribution of the tuberculous infection.

The mucous membrane of the bronchi is deeply congested. The bronchial glands show older caseous tubercle, encapsuled with fibrous tissue, and, in addition, some smaller acute tubercles.

MICROSCOPICAL EXAMINATION OF LUNGS.

The cavities seen in the upper parts of the lungs are lined by caseous material, alternating in places with fibrin and leucocytes. In this layer very few tubercle bacilli are visible, but there are many cocci and some short bacilli amongst the fibrin in some places.

Outside this is a varying amount of fibrous tissue. In the lung tissue adjacent are some small foci of tubercle with fibrous formation around. The remaining lung tissue shows catarrhal inflammation, the alveoli containing many large, vacuolated mononuclear cells, and some homogeneous cedematous fluid coagulated by the fixative.

A section from the consolidated part shows more acute changes. There are caseous patches invading the lung tissue without any encapsulation. Here and there are older caseous areas surrounded by fibrous tissue. The tuberculous areas in some instances definitely surround small blood-vessels, and in others are related to bronchi.

The rest of the lung tissue shows catarrhal changes similar to those already described and the vessels are engorged. The smaller bronchi all show bronchitis, varying in degree. Some have their walls invaded by tubercle and caseous contents in their lumen.

A section from the root shows a bronchial gland extensively caseous, with definite fibrous tissue surrounding this. Alongside is a large bronchus showing bronchitis, and a portion of lung with scattered caseous areas, most of which have a small amount of fibrous tissue around; the intervening lung shows catarrhal changes, the alveoli containing many large mononucleated vacuolated cells; some of these show phagocytosis. Tubercle bacilli are visible in the caseous area in the section stained by the Ziehl Zeelsen method.

Intestine.—In the lower part of the ileum there were many tuberculous ulcers occupying the Peyer's patches and causing irregular destruction of the lymphoid tissue. The serous coat of the intestine over the site of the ulcers is congested, and in a number of cases a few miliary tubercles may be seen. Six inches above the ileocaecal valve is a small perforation at the base of an ulcer with acutely congested surroundings. On the serous aspect the opening is surrounded with a rough deposit of yellow acute fibrinous exudate. To this perforation the acute peritonitis was due.

A very large ulcerated area is to be seen immediately above the ileocaecal valve, and in the large intestine below this are a few small ulcers. There was also an extensive band of ulceration about half way down the colon.

SUMMARY.

The progress of the disease in this case can be most easily understood if we divide it into three periods. During the first of these there occurred the original infection with the tubercle bacillus; and that an original nidus of infection was situated in the mediastinal and bronchial glands is apparent from the presence in these structures of calcified nodules. From these points of settlement further infection took place, and this resulted in the formation of new centres of tuberculosis, in which the process was both extensive and active. The time during which these centres became established we regard as the second period of the disease, and in it there were set up tuberculosis of the lungs, hip-joint disease, and tuberculosis of the suprarenal glands. The spread of tubercle bacilli to the lung was, in the first instance, by way of the peribronchial lymphatics in the upper lobes, with the result that these lobes were almost completely destroyed.

From infection carried by the sputum the tuberculosis set up ulceration in the intestine, and from the same cause tuberculous ulcers of the larynx had formed.

During this second period tuberculous arthritis of the hip-joint

and tuberculosis of the suprarenal glands were set up, and to these foci the tubercle bacilli were carried by the blood-stream.

The only date which can be given in connection with this period is that of the commencement of hip-joint symptoms in March 1912, or eleven months before death. While, therefore, there was a certain amount of infection by the blood during this period, it was of a minor order, and insufficient to establish general tuberculosis. In the hip-joint and in the suprarenal capsules the bacilli had settled, because the condition of these tissues for some reason favoured their growth.

During the second period, however, in the progress of the disease the power of resistance to the infection was gradually diminishing, and before death the third period had been entered upon, when general tuberculosis was becoming established. The immediate cause of death was the peritonitis which followed perforation of a tuberculous ulcer of the intestine. At the post-mortem examination, however, miliary tubercles were found in the liver, the spleen, and the peritoneum, and the fits and unconsciousness from which the patient suffered suggest that tuberculous meningitis had also set in. (Permission to examine the head was not obtained.)

The consideration of this case as the gradual development of a local into a general infection enables us to obtain a fairly complete picture of the progress of tuberculosis.

The question as to the type of tuberculosis remains to be considered. The type of the bacillus was not determined experimentally, but on the grounds that the mother died from pulmonary tuberculosis and that the primary lesion in the case was in the thoracic glands, it would appear probable that the infection was of the human type.

Remarks by Mr. Stiles.—"Although in the case here recorded inoculation experiments were not made to ascertain whether the tubercle bacilli which produced the disease were of the human or of the bovine type, the clinical history, as well as the nature, sequence, and distribution of the pathological lesions, all point to a primary lung and bronchial gland lesion due to inhalation of the human tubercle bacillus. As the mother was suffering from acute pulmonary tuberculosis, the source of the infection was obvious.

"Mr. John Fraser has recently investigated the material derived from 70 consecutive operations performed at the Royal Edinburgh Hospital for Sick Children on children suffering from tuberculous bone and joint lesions. He found that in 60 per cent. of the cases the disease was caused by the bovine bacillus, while in the remaining 40 per cent. it was due to the human bacillus. In none of the bovine cases was there a history of pulmonary consumption in either of the parents, while in the human cases, on the other

hand, it was noted that a history of pulmonary tuberculosis in one or other of the parents was obtained in 70 per cent. of the cases.

“The question as to the relative frequency of human and bovine infection in bone and joint tuberculosis in children is of the greatest importance in regard to the source of infection and the mode of entrance of the bacilli, as it is upon our knowledge of these facts that preventative treatment supported by compulsory medical legislation must be established.

“But there is another point which it is well for the surgeon to keep in mind in dealing with bone and joint tuberculosis, and that is, the extent to which the prognosis is influenced by the type of the bacillus causing the disease. If the bone or joint lesion is due to the human bacillus, as in the case here reported, it is obvious that the disease is secondary to a pulmonary lesion, and the more extensive the lung disease, the less chance is there of bringing about a cure of the joint disease. Indeed, operative measures in such cases are undertaken with the object of relieving the child of severe pain and sleeplessness rather than with the hope of curing the disease. When, on the other hand, the joint disease is of bovine origin, the child is frequently otherwise healthy, and in some cases even robust. The disease in these cases is generally secondary to tuberculous cervical or mesenteric glands produced by the ingestion of tuberculous milk. It is in these bovine cases that good results are obtained in the early stage of the disease by constitutional and conservative means, while in the more advanced stages the radical operation is generally followed by a permanent cure, with, of course, a certain amount of impairment of function.

“With regard to the tuberculous cervical glands, Dr. A. P. Mitchell has found that in 90 per cent. of the cases the disease is of bovine origin, the bacillus being conveyed by means of tuberculous milk to the tonsils and naso-pharynx, and from these to the cervical glands. Of the 64 tuberculous cervical glands in which the tonsils were also removed and examined, it was found that 37.5 contained histological evidence of tuberculosis.”

For his notes and for permission to publish the clinical account of this case I have to thank Mr. H. J. Stiles, F.R.C.S.

J. LORRAIN SMITH.

NOTES ON A SERIES OF CASES OF TUBERCULOSIS
OF THE MAMMA.

By ALEXANDER MILES.

It is generally recognised that the human breast is singularly seldom affected with tuberculosis. Virchow, indeed, included it amongst the organs which are not subject to this disease. In 1881, however, the tubercle bacillus was demonstrated in mammary tissue by Dubar, and since his classical study on the subject was published a sufficient number of cases have been recorded to prove that the breast only enjoys a comparative immunity.

Apart from the cases in which tuberculous lesions of the ribs or pleura invade the breast, with which we are not here concerned, the usual mode of infection is through the blood-stream. In some cases a primary focus of disease is discoverable, or a tuberculous history is forthcoming (*e.g.* Cases I., IV.); but in others the patient apparently enjoys perfect health, and shows no constitutional or hereditary tendencies (Cases II., III., VI.).

The available evidence is in favour of the view that the disease generally begins in the acini of the gland rather than in the connective tissue or ducts. The disease may be met with in the form of numerous isolated foci of varying size scattered through an area of the breast, each showing the characteristic structure of the tubercle nodule, while the intervening tissues are apparently healthy. As the condition progresses these foci fuse, and as caseation and liquefaction occur, a tuberculous abscess forms. Sometimes, as in Case VI., a thick wall encloses the débris—the so-called intra-mammary cold abscess. It is often difficult to find the tubercle bacillus in the tissues.

The following six cases illustrate some of the clinical aspects of the condition:—

CASE I.—An unmarried woman, aged 49. The first thing to draw her attention to the breasts was a gradual recession of the right nipple, which began about two years after the menopause. Shortly after this a white milky discharge began to escape from the nipple. At this time there was no swelling to be detected in the breast, which was of normal size and consistence and free of pain. Two years later, however, the lower half of the breast became swollen and painful, and was firmer to the feel than before. Under the influence of local applications the firmness disappeared, the swelling got less, and the pain diminished, the only discomfort being a feeling of tightness in the breast. As the discharge from the nipple and a degree of swelling in the lower part of the breast persisted, she applied for advice at the Royal Infirmary.

On examination a firm swelling, almost cartilaginous in consistence and about the size of a hen's egg, was felt in the lower half of the breast. The upper margin was sharply defined, but below, the swelling merged into the breast tissue. The swelling was easily recognised by picking it up between the fingers and thumb, but became less evident when pressed firmly against the chest wall. The skin was not adherent to the swelling, and the breast moved freely on the chest wall. The nipple was retracted below the level of the areola, and thin milky fluid could be pressed from it. On microscopic examination no organisms were found in the fluid and no growth took place in culture media.

As ten years previously I had amputated the patient's right leg for intractable tuberculous disease of the knee, and as the family history was unsatisfactory, six members having died young—one of pulmonary phthisis at the age of 33—the diagnosis of tuberculous mastitis was at once suggested, and was eventually confirmed by microscopic examination.

The whole breast was excised, and eventually the patient made a satisfactory recovery.

CASE II—A married woman, aged 36, gave the history that a fortnight after the birth of her ninth child, which died a few days after it was born, inflammation began in her *right* breast and went on to supuration. The abscess which formed was frequently lanced by her doctor, but eventually healed. About three years later she experienced a slight pain in the breast, and noticed a small firm lump close to the nipple. This lump gradually increased in size during the next three months, and then somewhat suddenly became acutely painful, softened, and burst, giving exit to a considerable quantity of thick matter. After the discharge had continued for some weeks she sought advice at the Royal Infirmary, when a large firm mass was found occupying the central part of the corpus mamma. The nipple was markedly retracted, and close to it was a sinus from which blood-stained pus of a tuberculous character could be pressed. The skin over the swelling was of a dark blue colour. The breast was freely movable on the chest wall. The axillary glands were enlarged, soft, and tender. Although she had never been able to nurse with the right breast, the retraction of the nipple only dated from the appearance of the lump. There was no other evidence of tuberculosis discoverable, and the family history was negative.

As the patient would not consent to the removal of the breast, the affected segment was excised, and owing to the presence of a mixed infection, the cavity was packed with iodoform gauze. It gradually closed, and the patient left hospital with a comparatively superficial ulcer in about a fortnight. Microscopic examination of the tissue removed showed it to be a tuberculous mastitis.

Five weeks later she returned to hospital with a sinus still discharging, and an extension of the disease in the remaining portion of the breast. Complete removal of the breast with the axillary contents was carried out, and the wound healed. Two years later, Dr. Reid of Forth, her medical attendant, reports that she has had no further trouble from the breast and is in excellent health.

CASE III.—A married woman, aged 47, who, three months before seeking advice, had noticed a degree of stiffness in the left shoulder which she attributed to excessive work involved in removing from one house to another. A few weeks later she detected a firm lump about the size of a walnut in the upper and outer parts of the breast towards the armpit. It caused her no pain, but was slightly tender on pressure. She had a family of ten healthy children, had hitherto enjoyed excellent health, and there was no history of tuberculosis in her family. Since the lump appeared, however, she had fallen off in health, and had lost weight considerably. There was no evidence of pulmonary tuberculosis. The lump steadily increased in size, became softer, and, after lasting for over two months, burst, giving exit to a quantity of thick flaky pus.

On examination it was found that both breasts were pendulous, the left being somewhat larger and fuller than the right. The left nipple was retracted, and on the upper and outer quadrant of the breast were two small ulcerated areas from the centre of which pus could be pressed. The edges of the ulcers were thinned out and undermined, and the surrounding skin had the characteristic bluish hue associated with tuberculous lesions. In this segment of the breast was a firm nodular swelling which continued into the axilla as a broad mass, evidently made up of matted lymph glands. The whole was attached to the underlying muscle and fascia, and could not be moved like the rest of the breast. There was little difficulty in recognising the nature of the condition.

An elliptical incision was carried from the nipple outwards towards the axilla, and the whole of the affected area of the breast, together with the axillary glands, was excised. As the disease infiltrated the pectoral muscle, a portion of this was removed also. The patient made a slow but eventually satisfactory recovery. She has since been lost sight of.

CASE IV.—The patient was 29 years of age. Her first child was born when she was 21. In the seventh month of her second pregnancy an abscess formed without acute symptoms in the lower and outer quadrant of the left breast. When incised this was found to contain thin watery pus, and it rapidly healed. Two weeks later a similar abscess formed in the upper and inner quadrant of the breast.

It contained thick flaky masses of tuberculous debris, and did not communicate with the previous abscess. In view of the patient's condition, resection was not proposed; the abscess was scraped with the sharp spoon and slowly healed. The patient was otherwise healthy, but one of her sisters had died of "consumption."

CASE V.—The next case occurred in a married woman, aged 35, who for about three months had complained of some pain in the left breast, followed by the appearance of a small tender lump in the substance of the gland to the upper and outer side of the nipple. A month later a similar lump formed a short distance above the nipple. In the course of about six weeks the second lump gradually softened, the skin over it assumed a bluish colour, became thinned out and eventually broke, giving exit to a quantity of thin seropurulent fluid mixed with blood. The pain was relieved by the bursting of the abscess, but the sinus continued to discharge.

When she applied for advice, a firm, irregular mass was found in the upper and outer quadrant of the breast, measuring about 5 inches in its long axis towards the axilla and about 3 inches across. A small opening with characteristically thin and bluish edges marked the site at which the abscess had burst, and a probe could be passed for some distance into the breast. The skin was movable over the greater part of the swelling, and the breast was not attached to the chest wall. The nipple was markedly retracted, but this state of affairs dated back some sixteen years, having commenced shortly after the birth of her first child, and when her second child was born seven years later, it was so depressed that it could not be used for suckling. Only a single enlarged axillary lymph gland could be detected, and it was quite firm.

The affected segment of the breast was excised by an elliptical incision, and the enlarged gland removed. The wound healed by primary union, and there has been no further trouble. On microscopic examination the condition was found to be a chronic tuberculous mastitis. The patient was not a robust woman. After her first confinement she made a very slow recovery, and during her third lactation she had an abscess in the left breast, which, however, healed rapidly after incision. For about six months before the development of the tuberculous affection she had been falling off in health and becoming thinner, but there was no evidence of active tuberculosis to be detected in any other organ. Her mother died at the age of 45 from "a tumour of the left breast," and her father at 22 from "inflammation." Her brothers and sisters were healthy.

CASE VI.—A waitress, aged 23, noticed a small swelling in her right breast, near the nipple, four months before she was seen by me.

The swelling was firm to touch and painless at first. It gradually increased in size and became softer, and within the last three months caused slight twinges of pain. When she sought advice the swelling was about the size of a Tangerine orange, semi-solid in consistence and tender on pressure. It occupied the central portion of the breast, underlying the nipple; the skin was not adherent over it, and the nipple was not retracted. There was no enlargement of the axillary glands. The general health was excellent, and there was no history of tuberculosis in the patient or her family.

To avoid disfigurement, an incision was made at the outer border of the breast, and the abscess dissected from the surrounding breast-tissue. It had a thick fibrous wall and contained several ounces of thick greenish-yellow pus. On microscopic examination the wall was found to be lined with tuberculous granulation tissue containing numerous giant cells. The wound healed by primary union. Sufficient time has not elapsed to show if the cure is permanent.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., J. D. COMRIE,
M.D., AND ALEX. GOODALL, M.D.

THE HEART IN DIPHTHERIA.

AN important study of the irregularities which occur in the action of the heart in diphtheria is presented by Hume and Clegg (*Quart. Journ. Med.*, October 1914). Their observations were made on 40 cases which showed cardiac irregularity among 573 cases of diphtheria admitted to the Hospital for Infectious Diseases at Newcastle-on-Tyne. Of these, twenty-two showed the signs of a sinus arrhythmia, although the cardiac signs and symptoms were healthy. The remaining eighteen cases showed various characters, and are divided by the observers into three groups. In group I. they include six patients who were very ill from the onset of the disease, in whom there were gross and varying irregularities of rhythm, with, in four cases, an identical pathological picture. In these patients the diphtheritic membrane was extensive and the general manifestations of a severe toxæmia were present. Prostration was great, vomiting was frequent, and death supervened before the fifteenth day. Dilatation of the heart became obvious before the sixth day, and the polygraph showed many irregularities. Premature contractions in the auricles or ventricles preceded a grosser type of arrhythmia and the rhythm of the heart sometimes changed from day to day. Post mortem there was found a marked fatty degeneration of the muscle fibres, especially in the ventricular wall, with patches of interstitial myocarditis and dilatation of the smallest capillaries. In the sino-auricular node were an increased vascularity and actual hæmorrhages, while there were no gross changes in the auriculo-ventricular node nor in the auriculo-ventricular bundle or its branches. In group II. were included nine cases manifesting a less severe clinical condition in the early stages, although the patients had very septic throat conditions and made a protracted stay in hospital. The heart irregularities included auricular and ventricular extrasystoles and a reversal of the normal beat. Post-mortem examination in one case showed a complete absence of the increase of fat in the muscle fibres, which was so noteworthy in the cases of group I.; and the only pathological features were the increased vascularity and the presence of scattered patches of interstitial change in the ventricular muscle. Group III. included three mild cases in which the throat condition was

not severe ; some cardiac irregularity occurred without any other sign of involvement of the heart. In the analysis of these cases the writers find it impossible to correlate the pathological lesions with the individual instances of arrhythmia. Irritative and destructive processes are taking place simultaneously, and result in excitation or depression of the various functions of the heart muscle. For instance it is impossible to state whether a nodal rhythm depends on hyperexcitability of the *a-v* node or a depression of the *s-a* node, allowing the lower node to usurp the function of pace-maker of the heart which belongs properly to the upper node. Further, the types of arrhythmia in each individual case may vary from day to day, dependent upon varying and progressive pathological changes in the heart muscle and its nerves. The important teaching of this investigation is that any form of arrhythmia of the heart (except sinus arrhythmia) in diphtheria indicates that the heart muscle or nerves are involved in a pathological process, however mild the illness may otherwise appear to be, and that special precautions are necessary in order to keep the patient recumbent.

ANÆMIA AND ULCER OF THE STOMACH.

Bolton (*ibid.*) contributes a clinical and experimental study upon the important question as to the supposed influence which anæmia exerts upon the formation and fate of acute gastric ulcer. The clinical evidence of such an association is, according to Bolton, unsatisfactory, and appears to rest simply upon the grounds that chlorosis frequently occurs in the same person as ulcer of the stomach ; that a history of anæmia may commonly be obtained in the subjects of gastric ulcer ; and that young females are particularly liable to be attacked by gastric ulcer. His attention was directed to the influence of anæmia by observing that in all cases where a patient suffering from acute gastric ulcer died of hæmorrhage after surviving for a certain length of time, the edges of the ulcer were found to be well advanced in healing. He quotes 12 cases to show that, despite the anæmia following the hæmorrhages, acute ulcer in the human subject heals rapidly and in the normal manner when placed under suitable conditions as to rest and stoppage of gastric secretion. None of the twelve cases quoted had suffered from chlorosis.

The experimental part of the work was carried out by producing ulcers in the stomach of cats by injecting into them the serum of a goat immunised against cats' gastric cells. The anæmia was produced by abstraction of blood from the femoral or carotid artery. It was clear from these experiments that a previous and very considerable loss of blood does not affect the formation of an ulcer either as regards extent or depth, and also that anæmia has no effect in retarding the healing of an acute artificial ulcer. When the anæmic animal was allowed to

eat meat, any delay in the healing was due to the diet of the animal and not to the anæmia.

ADRENAL INSUFFICIENCY.

Williams (*Journ. Amer. Med. Assoc.*, December 1914) gives a paper dealing with the syndrome of adrenal insufficiency, which he holds to be recognisable like thyroid insufficiency or the hypophyseal insufficiency of Cushing and others. He includes in this category cases of profound neuro-muscular depression different from that attributable to the nervous system, with asthenia, lack of concentration, low blood-pressure, sometimes psychical peculiarities, and sometimes pigmentation. In one case with these symptoms having a systolic blood-pressure of 100 and severe psychasthenia, the patient was ordered rest, suitable diet, and was put on dried adrenal gland tablets, 2 grains three times daily. A gradual improvement took place, and within about a year the patient was feeling fit, was able for intricate work, and had a blood-pressure of 118. In another case a mechanic, aged 57, had been weak and dizzy after an attack of malaria, with throbbing in the abdomen, tremors in the fingers on spreading out the hands, a trace of von Graefe's sign, and a blood-pressure of 108. He was treated with adrenal substance, and went back to work quite recovered. Other cases which the writer records showed similar symptoms, and still others did not respond to treatment. In one case which ended fatally a 17-year-old girl began to tire easily in study and play, and later showed extreme asthenia, dilatation of the pupils, and browning of the skin. Post mortem there was found extreme atrophy of the suprarenal glands with lymphocyte infiltration. The writer thinks that this condition may be due to exhaustion of the chromaffin system as a result of special demands made upon it.

INTESTINAL STASIS.

Einhorn (*ibid.*, September 1914) gives the result of his experience upon the question as to whether stasis is really produced by "kinks" other than of an organic nature, and whether auto-intoxication from the bowel in cases of slow passage of the contents has any objective reality. He agrees with the recommendation of Glénard, Lane and others that in mild cases of visceroptosis an appropriate abdominal supporting bandage should be worn, but he is entirely opposed to ileocolostomy or colectomy as a means of treatment except in cases of cancer or stricture of the bowel. He points out that many persons suffer from constipation without presenting the symptoms often attributed to auto-intoxication, and that the headaches, nausea with vomiting, anorexia, loss of weight, cold extremities, mental apathy, constipation, bad taste in the mouth, abdominal distension, and muscular pains may be ascribed more properly to mechanical and nervous influences than to the pro-

ducts of bacteria. He believes that the delayed passage in many of these cases is salutary, serving to make absorption more complete, and is encountered especially in cases of insufficient nutrition.

DYSPNŒA IN RELATION TO BLOOD REACTION.

The association of dyspnœa with acidosis in diabetes and some other diseases is generally recognised, but Lewis and Barcroft (*Quart. Journ. Med.*, January 1915) draw attention to the fact that dyspnœa in many cases where it might be considered to be merely mechanical is found to be associated with this change in the blood. Other symptoms which accompany the condition are Cheyne-Stokes' breathing, increase of the pulse-rate, and subnormal temperature. The condition being very generally associated with fibrosis of the kidney, the various symptoms grouped under the designation uræmia may also be present. The clinical state in which it may come on may be so varied as renal disease, mitral disease, aneurysm, aortic disease, arterial disease, emphysema, bronchitis, pleurisy, etc. The method of examination adopted in these cases was the estimation of the percentage saturation of the blood with oxygen when exposed at 37° C. to 17 mm. pressure of that gas. The percentage saturation of normal blood is 75 to 80 per cent. ; and in proportion as the quantity of acids, relative to bases, is excessive, the percentage saturation drops. In some of the elderly cases examined the percentage saturation was as low as 52 per cent. Generally speaking, young patients suffering from heart disease do not show this, but the majority of patients suffering from permanent want of breath and exhibiting the classic signs of heart failure owe their symptoms in part to acidosis. J. D. C.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

INTERNAL DERANGEMENTS OF THE KNEE-JOINT.

A. H. TUBBY (*Surg., Gynecol., Obstet.*, December 1914) is firmly convinced that the prime factor in the production of displacement of cartilages and other internal derangements is undue lateral movement in the joint, from whatever cause that may be brought about. It makes no difference if the internal ligament be damaged either from sudden strain, as in the athlete, or from a strain due to abnormal anatomical relations between the head of the tibia and the lower end of the femur as in genu valgum. In this latter case the strain is a constant one, and causes lengthening and weakening of the internal ligament, and thus in certain positions and at certain stages of con-

traction of the neighbouring muscles there is an undue laxity on the inner aspect of the joint allowing of the displacement of the cartilage. The author has revised his method of treatment, and states that, if undue mobility can be effectually controlled, the necessity for operation is largely discounted. In an early case of displaced semilunar he reduces it under an anæsthetic, accepting as evidence of reduction complete extension of the knee. The limb is then placed in extension in plaster of Paris for three to six weeks to allow the injured parts to settle down and heal. Then an apparatus is fitted which permits of limited flexion but no lateral movement of the joint at all. From time to time the angle of flexion is increased as the lateral mobility of the knee-joint becomes less marked, until full flexion and extension without pain or difficulty are present, and then the apparatus is discarded, treatment usually lasting from six to nine months. Treatment must be begun early, and in its early stages be very thorough. An index to the severity of the tear of the cartilage is, in the author's opinion, given by the amount of effusion shortly after the accident.

In the case of weighty patients, in those with genu valgum, and in long-legged people it is necessary that the apparatus should extend nearly the whole length of the limb, from the junction of the upper and middle third of the thigh to the ankle. A short apparatus fails to control the leverage of the limb at the knee, and therefore the joint must be controlled in the way mentioned above.

As long as tenderness remains over the internal cartilage or over the inner border of the patella, the patient should be advised not to walk, and in cases in which there is still pain and the patient requires operation, Mr. Tubby not only excises the cartilage, but also finds it a satisfactory procedure to remove the subsynovial tissue on the lower and inner side of the patella. Five per cent. of cases only are found requiring operation. He operates only on the following grounds:— (1) When the patient is unable to give the necessary time, and has not the means to afford the apparatus required, for mechanical treatment. (2) Where the patient is unable to obtain his livelihood with the splint on. (3) In the case of those who go up ladders, work on scaffolds, or amongst machinery where a sudden and unexpected fall might be fatal. (4) Where a support has been faithfully tried and has failed.

In operating on a knee-joint there is, in the author's opinion, more risk of disaster than in any form of surgical procedure, and when disaster does occur, it is overwhelming. He adds that the potentialities for mischief to the knee-joint are about equal to those of ten abdominal cavities. Thus Mr. Tubby makes it his rule to lay the risk before the patient, and to advise, if at all possible, conservative treatment. He decides not to operate (1) in any case of primary

displacement ; (2) where a patient is content to wear an apparatus for a considerable length of time. If operation is decided upon, special points with regard to technique both before and at the operation are necessary, and his routine is worthy of note. His first wish is to render the skin, often hard and rough, completely aseptic. Preparation is commenced 2 days before operation, the skin washed with soap and water, then ether and alcohol, and wrapped in a 1 in 3000 biniodide of mercury compress. Three hours before the operation acetone and iodine are painted on the part. At the operation no finger is ever introduced into the joint, and the capsule is stitched up with blanket sutures. The skin is stitched up by interrupted sutures of silkworm gut, and the gut has a needle at each end so that the needle passes from deeper tissues out through the skin and never in the reverse order. If care be taken with the skin, and if aseptic precautions be redoubled, the results will almost always be satisfactory.

STONE IN THE PELVIS OF KIDNEY.

Ralph Duffy (*Amer. Journ. of Surg.*, November 1914) has a very interesting paper on the choice of method of operation employed for the removal of stone from the pelvis of the kidney. Nephrotomy since 1880, when it was first performed by Henry Morris, has been the favourite operation. However, also about 1880, Czerny began to advocate incision into the kidney pelvis, and thus we have two available procedures.

The author used to perform nephrotomy in all his cases, but an extremely grave hæmorrhage in an otherwise simple case led him some time ago to reconsider his views and arrange the pros and cons of each side. The great objection, he says, to nephrotomy is hæmorrhage. This may come on at operation, or within 24 hours, or be deferred as long as three weeks. It may be slight or fatal. At the time of operation the hæmorrhage can be controlled by pressure on the pedicle, either by a special clamp or by the fingers of the assistant. Approximation of the cut surfaces by through-and-through sutures of catgut is the only reliable method after operation to prevent further bleeding.

To cut across the fewest vessels in incising the kidney, the knife is entered just posterior to the convex border, as Broedl showed that the smallest vessels were there. Cullen and Derge have advised dividing the kidney with silver wire instead of a knife, as less hæmorrhage results. However, the division is performed, and hæmorrhage, as stated above, is the great present and future trouble, and thus pyelotomy became popular. Pyelotomy cannot always be performed, and there are two distinct classes where it is impossible—(1) The kidney cannot be delivered well up into the wound. For better access W. J. Mayo advises clearing the lower border of the last rib, dividing

the quadratus muscle and the lateral arcuate ligament, and thus good exposure can usually be had. (2) Eisendrath says that in 20 per cent. of cases the pelvis as a pelvis hardly exists, as it branches right into the kidney substance. This, however, can be at least guessed at if a good radiogram be taken. The method of pyelotomy used is to expose the kidney pelvis, elevate it into the wound by two stay-sutures, and to cut between with fine scissors. Care should be taken to incise and reflect the layer of fatty tissue covering the pelvis, and carefully to displace any vessels that may be in the line of the proposed incision. Incision in the pelvis must not reach the uretero-pelvic junction lest stricture of the ureter result from contraction.

Hæmorrhage is not marked in pyelotomy as a rule, but it may occur. The bleeding seems to come from the stone tearing through the eroded pelvic wall into the surrounding venous plexus, and thus careful delivery of the stone is required. Fistulæ following pyelotomy, formerly so feared, seem latterly to be much less frequent. The fatty layer covering the pelvis should be stitched back into place. From the above reasoning and from his personal experience the author is convinced that pyelotomy is destined to win over nephrotomy, as it is a simpler and a safer operation.

CHLOROFORM ANÆSTHESIA.

John Stewart of Halifax (*Canad. Med. Assoc. Journ.*, December 1914) has an article of great value on this important subject. He commences by describing his recollection of the dismay that spread through the Edinburgh Royal Infirmary in 1877 when it became known that a patient had died from the results of chloroform, the first case in nineteen years. Dr. Snow says there are two essentially different ways in which chloroform may kill, viz. by a direct sedative action on the heart when the chloroform is in a large proportion to the air, and by a suspension of the respiratory functions while the heart is still acting when the chloroform is largely diluted. By experiment Lister showed that the percentage of chloroform vapour inhaled by a patient anaesthetised in the ordinary Edinburgh method, that is, the open method, chloroform being sprinkled on a towel or a piece of lint, was practically within the limits of safety laid down by Snow. It was evident, then, that the essential point in giving chloroform was to watch the respiration, for this would afford the earliest indication of overdose, and the Edinburgh rule was to see that the respiration was unobstructed and unembarrassed, and to give chloroform freely. In London the first care of the anaesthetist was to watch the pulse, and it happened that the earliest intimation of cardiac mischief was a sudden failure of the heart, generally quickly fatal. Thus in London the administration of chloroform was said to be dangerous and was given up, and controversy between the two schools began. Dr.

Stewart says that the reasons of all the difficulty are that, without the courage to give chloroform freely, without the self-control to attend strictly and only to respiration, the nervous chloroformist is constantly pinching the patient's skin, raising the mask to test the corneal reflex, doing a dozen things instead of attending to one. He does not give enough chloroform, and what the patient does get he gets irregularly. Timidity is as dangerous as recklessness. The chloroformist must be cautious, but he must also be bold. Statistics are fine materials, he adds, to juggle with, and must be sharply criticised. Compare the Erlangen chloroform mortality (from pneumonia alone) of 13 per 1000 with Lieutenant-Colonel Lawrie's 45,000 cases without a death; also compare the estimate of Wood that chloroform is fatal in 1 out of every 3000 cases, with 1 in 600 at St. Thomas' Hospital.

With regard to the dangers of giving chloroform to patients suffering from diseased hearts, etc., some statements made by authorities are interesting. Lister said that if a person with known cardiac affection decides to place himself in the hands of a surgeon, so far from being unsuited for the anæsthetic, he is before all others the man who stands most in need of its protecting influence. Huehard, the eminent French clinician, does not admit that either heart disease or angina pectoris is a contra-indication to the use of chloroform. Dr. James Mackenzie, while a surgeon at Burnley, had full confidence in chloroform, and is to this day an advocate of this anæsthetic. Sir William Macewen says that in brain surgery the anæsthetic ought to be chloroform—never ether.

The author concludes by saying that with chloroform anæsthesia, given often by unqualified assistants, he has had many anxious moments, many of them false alarms, most of them due to insufficient chloroform; and in the few cases in which real danger seemed to threaten it was through artificial respiration that the patient was restored to safety. Chloroform when properly given is the most convenient, most easily manageable, most universally applicable and safest of anæsthetics.

F. E. J.

THE PREVENTION AND TREATMENT OF TETANUS.

1. *Prophylactic Injection of Antitetanic Serum.*—Bazy (*La Presse médicale*, 4th February 1915) points out that the prophylactic value of antitetanic serum in animals is proved, whether it is injected at the time of the operation, *e.g.* castration or docking of the tail, or whether it is given when infection of the wound has taken place by pyogenic organisms.

His observations are based on cases he has dealt with in a camp in Paris. They refer to 10,896 wounded, among which there were 129

cases of tetanus—about 1·2 per cent. Of the 129 cases 90 died—a mortality of about 70 per cent.

He has found that in the *services sanitaires*, in which it is the systematic practice to give prophylactic injections, the mortality has been about 0·418 per cent., while in the others it has been 1·279 per cent.—that is to say, nearly three times as great.

He gives statistics of another interesting observation. There were two groups of wounded, numbering 100 each, and suffering from wounds of apparently the same severity. In one group prophylactic injections were given to all, and only one case of tetanus developed. As the symptoms appeared the day after the injection was given, Bazy considers that the serum had not had time to act, and he therefore places the incidence of tetanus in this group at 0 per cent. In the second group, in which he was not able to give the serum, there were 18 cases of tetanus.

The author is unable to confirm the opinion that wounds by rifle bullets are not followed by tetanus, as he had 9 cases following such wounds.

He concludes that all patients wounded in war should be given prophylactic injections as early as possible after injury, and that the serum should be used even if several days have elapsed. When it is necessary to economise in serum he favours giving smaller initial doses to all rather than giving large doses only to those who have been wounded by shells or have had their wounds contaminated by earth.

Siewi (*Bull. de l'Acad. de Méd.*, 12th January 1915) expresses a very strong opinion in favour of prophylactic administration of anti-tetanic serum. He was attached to an army corps which was heavily engaged, and out of 17,507 wounded he only met with 7 cases of acute tetanus. He admits that a certain proportion of the wounded evacuated from the ambulance and field hospitals under his care may subsequently have developed the disease, although the cases specially liable to develop tetanus were, as a rule, kept long enough to admit of the symptoms appearing. None of the seven patients had had prophylactic injections, and all died. The author's invariable practice was to give serum freely to all patients who had been injured by shell and whose wounds were lacerated and contaminated, and to this, combined with antiseptic measures, he attributes the infrequency of tetanus amongst the wounded who passed through his hands.

Tuffier, in an interesting contribution to the study of military surgery (*Brit. Journ. of Surg.*, January 1915), deals with the preventive treatment of tetanus. The ideal would be the destruction of the germs by means of the first dressing, but unfortunately this counsel of perfection cannot be carried out at the front. Antitetanic serum must therefore be used at the earliest possible moment. In

various French hospitals it is the invariable rule to give the serum to all patients immediately on admission. Tuffier is of opinion that it should be administered on the field, and should be systematically injected before the first dressing is applied.

In an editorial note J. B. Murphy says that "the results from the primary or immediate injection of a full dose of antitetanic serum are so effectual and satisfactory that it does not seem to us that we are justified longer in trying any other prophylactic treatment."

2. *Subcutaneous Injections of Carbolic Acid.*—Talamon and Pommay (*La Presse médicale*, 19th November 1914) have formed a favourable opinion of the method of Baccelli for the treatment of tetanus. They claim for it that it is simple, without danger to the patient, easily carried out, and inexpensive. The technique they employ is as follows:—20 cubic centimetres of a 1 in 100 solution of pure carbolic acid are injected into the subcutaneous tissues every four hours during the period that the contractions persist. The solution they employ is made up thus:—

Crystallised carbolic acid	.	.	.	.	10 grms.
Pure glycerine at 30°	.	.	.	.	50 "
Distilled water to	.	.	.	.	1000 "

Each dose of 20 centimetres of this solution represents 20 centigrammes of phenol; the six injections given in the twenty-four hours therefore represent 1.20 gramme of phenol. With this apparently large dose they have never seen symptoms of intoxication, although occasionally there is a slight degree of carboloria. The injections have been continued for from 8 to 10 days in some cases.

The injections are made into the subcutaneous connective tissue of the arm, the thigh, or the abdominal wall. Beyond a slight pain at the seat of injection, there is no discomfort or disturbance.

With this treatment the authors have always associated the administration of chloral, in doses varying from 6 to 8 grammes daily, by the mouth or rectum. They are not convinced that any appreciable advantage has been gained by giving antitetanic serum in addition.

Nigay (*La Presse médicale*, 21st January 1915), as a result of observations on 36 cases treated in a military hospital during September, has formed the opinion that injections of carbolic acid have no effect on the development of tetanus. He considers chloral the most efficacious drug we possess. Large doses of antitetanic serum appear to increase the resistance of the patient, but in acute cases he did not obtain a cure.

In the course of some observations on the cerebro-spinal fluid in acute tetanus, Sainton and Maille (*Bull. de l'Acad. de Méd.*, 29th December 1914) incidentally found that in cases treated by injections of carbolic

acid, after the method of Baccelli, carbolic acid could not be detected on the most careful examination in the cerebro-spinal fluid. Whatever benefit this treatment may yield, they conclude that it cannot be due to the neutralisation of toxins in the cerebro-spinal fluid.

The German journals are not at present reaching us, but from abstracts published in the American journals we gather that the disease has been rife among the German wounded. Some writers appear to have found the injection of magnesium sulphate beneficial, but others have nothing good to report of it. Four cases are reported in which salvarsan is believed to have done good. Full doses of chloral have yielded good results also. The free application of peroxide of hydrogen to the wound after clipping away torn and devitalised tissue is recommended by Muehsam. A. M.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

VENTROFIXATION AND VENTROSUSPENSION AND SUBSEQUENT CHILD-BEARING.

OF late the operation of ventrofixation in women still comparatively young and in the reproductive period of life has fallen somewhat into disrepute. The degree to which subsequent confinements have been interfered with, and even rendered dangerous, has been stated to be so considerable that there has been a revulsion of feeling against the operation, save in the case of women past the child-bearing time in life. Professor M. Muret of Lausanne (*Rev. méd. de la Suisse Romane*, November 1914, ann. 34, No. 11, p. 617), however, is of opinion that the risks of the operation have been exaggerated, and that they have in many cases been due to faulty technique. He has earned the title to speak with some authority on this subject, for he has performed 225 hysteropexies for movable or fixed retroflexions with or without prolapsus in women of all ages, nulliparous or multiparous; and he has been able to follow out 38 cases of subsequent pregnancy in 31 of the women thus operated upon. Full details, in tabular form, are given of these 38 pregnancies; and it may at once be stated that the sombre picture of post-operative disabilities painted by other gynecologists is not that presented here.

Professor Muret lays great stress upon the technique. He believes that four details in particular are very important. He makes the ventrofixation low down in relation to the uterus; that is to say, below the line of insertion of the round ligaments; and he also makes it low down in relation to the abdominal wall; that is to say, immediately above the symphysis pubis. Further, he makes the fixation super-

ficial, not passing the sutures deeply into the substance of the anterior wall of the uterus; and finally he makes the fixation narrow in extent, only about one-third of the width of the anterior wall of the organ being involved. He tacks the *fundus* to the anterior abdominal wall only in the case of women whose *annexa* have been removed, or who are past the child-bearing age. The operation is briefly described as follows:—A vertical incision, about one and a half or two inches in length, is made in the anterior abdominal wall immediately above the symphysis pubis; the recti and pyramidales muscles are separated in the linea alba; the peritoneum is opened and the uterus is drawn upwards with fingers or forceps (grasping it from before backwards)—if there are adhesions they are separated; the ovaries, tubes, and the appendix are examined, and, if diseased, are removed; a silk ligature is then passed through the anterior uterine wall just below the level of the round ligaments, and embracing a little less than an inch of the uterine surface; a second ligature is passed just below the first; then the ends of the two ligatures are passed through the parietal peritoneum, the corresponding rectus muscle, and the aponeurosis which covers it as near as possible to the symphysis; the peritoneum in the lower part of the wound is closed by an over-cast of catgut; the two uterine ligatures are tied on the aponeuroses which they draw together, and the upper part of the incision is closed by a continuous catgut suture; and, finally, the aponeuroses of the recti muscles and the skin of the anterior abdominal wall are united by stitches. The immediate results of the operation are generally quite simple, and depend for any gravity they may possess rather upon the associated operations (*e.g.* appendicectomy) than upon the ventrofixation itself. At first the uterus lies a little high, but in time it sinks to its normal level in the pelvis.

The results which follow upon the occurrence of pregnancy are next considered by Professor Muret. Stated briefly, there were 28 full-time labours, 3 premature confinements, and 7 abortions, of which one was induced at two and a half months for maternal tuberculosis. Some very interesting details are given of the development of the uterus in these cases of post-operative pregnancy; from these it emerges that the first half of gestation was normal, the uterus ascending and developing without dragging on the cicatrix, without bladder troubles, and without exaggerated discomfort of any kind. During the second half of pregnancy the only anomalies noted were a more rapid development of the antero-inferior segment of the uterus and an early engagement of the foetal head in the pelvis. Professor Muret did not regard the percentage of abortions (6 out of 38, or 15·8 per cent.) as being excessive; and, further, from a detailed examination of the clinical facts in each of the six cases he concluded that there was none in which it was permissible to blame the hysteropexy. So, too, with

regard to the three premature labours; the evidence against the influence of the ventrofixation in their production was either negative or inconclusive. The full-time labours (28 in number) were surprisingly normal; in none was there too great elevation of the cervix, excessive ante-flexion of the uterus, dystocia requiring version or Cæsarean section, grave post-partum hæmorrhage, retention of the placenta, or subinvolution of the uterus. In three cases only was the Credé grasp required in the third stage. Further, the results so far as the children were concerned were excellent; all the 28 infants were born alive or lived, and most of them were of large size. Even the three prematurely-born children added two living ones to the list, but one perished a short while after birth. The puerperium was normal in every case, save that in some instances the fundus uteri was a little longer than usual in passing below the pelvic brim. In 33 out of the 38 cases it was possible to trace the later clinical history of the women, and in two only was there any return of the uterine displacement; in one of these catgut sutures had been used instead of silk in the making of the ventrofixation, and in the other the labour had occurred under the care of a midwife who had neglected to obtain medical assistance for the repair of the perineum which was then torn.

From a study of his clinical material Professor Muret is justified, therefore, in drawing the conclusion that a hysteropexy situated low in relation to the uterus and to the anterior abdominal wall, such as he describes, does not hinder the necessary expansion of the uterus in pregnancy, and gives excellent obstetrical results. That satisfies one part of the requirements of the case. But he claims that the other part of the problem is also met, and that the correction of the uterine displacement is complete and permanent, standing the strain of subsequent confinements. If this be so, then his contention is sustained, and it follows that direct abdominal hysteropexy is a thoroughly satisfactory operation for women suffering from uterine retro-displacement and prolapsus during the continuance of their active reproductive life. This, however, is not the experience of other gynecologists; too often the operator who succeeds in fixing the uterus firmly enough finds that sterility or abortions follow, whilst the one who keeps in mind the expansion which future pregnancies call for fails to maintain the organ in its proper place. It will be interesting to hear the results which others obtain who may use Professor Muret's methods.

H. A. Wade's report of the end-results after operation in 109 cases of displacement of the uterus, bladder, and rectum includes 33 in which the uterus was suspended from the anterior abdominal wall along with some form of vaginal repair; there were also seven in which the only operation was ventrosuspension (*Amer. Journ. Obstet.*, November 1914, vol. lxx. p. 706). In all the other cases the operation of shortening of the round and broad ligaments with or (very rarely)

without vaginal repair was performed. Wade, therefore, had not the same high opinion of the abdominal operation as Muret; in seven cases alone did he rely upon ventrosuspension (with No. 2 chromic catgut) as the sole operative procedure, and he found that in five of these the uterus was in its place, and appeared to be movable when examined two years later, and that in three the patient felt better; one of the seven became pregnant. Of the 33 cases in which the ventrosuspension was accompanied by vaginal repair, the uterus retained its proper position two years later in 23; in 20 cases the patients felt some improvement; in 9 pregnancy followed, and whilst eight of the women were delivered of living babies, one died. Of course much depends upon the method of vaginal repair with which Wade reinforced the abdominal operation. It was always the same and it had been devised by himself. It consisted in dilating the cervix and thoroughly painting the interior of the uterus with a 50 per cent. solution (in alcohol) of tincture of iodine; there was not, however, any curetting. If the cervix was hypertrophied the excessive portion was removed. Next, an incision was made beginning at the lateral muco-cutaneous junction of the posterior aspect of the vaginal outlet. The amount of tissue that, without undue tension, could be brought up to the urethra was estimated. Then the muco-cutaneous junction at this point was grasped with a mouse-toothed forceps, and with slight traction a curved incision was made with a pair of scissors, the convexity directed towards the anus, extending to a point at the same level on the opposite side of the vaginal outlet. A flap of mucous membrane was then dissected upward and held clear of the field of operation with a clamp. By means of the gloved index fingers the dissection was continued laterally until a firm fascial layer was made out. The layers of fascia and muscle were brought together with a continuous suture of No. 2 chromic catgut, and the superficial fascia was similarly united with the same strand of catgut. The skin was dissected free from the superficial fascia to the extent of one-eighth of an inch, so that the skin edges might easily come together. A clamp was next placed upon the posterior angle of the skin incision, and the wound was securely sealed with from four to seven Michel's clips, which were removed at the end of a week. Wade admitted that both suspension from above and the vaginal operation (just described) had advantages and disadvantages, and he, therefore, in many cases combined the two, sometimes associating the vaginal repair with ventrosuspension (as above) and sometimes with the operation of intra-abdominal shortening of the round and broad ligaments. He thus obtained better results, although he allowed that it was not easy to decide what benefit, if any, the patient derived from the suspension and what from the vaginal repair. In sixty-one cases in all some form of abdominal replacement was combined with the vaginal repair,

and in forty-two of these the result was satisfactory. In fifty the uterus had remained in position, and it was movable two years later. Fourteen of the patients had become pregnant; two had aborted, ten had normal deliveries, and two had been delivered by forceps.

The ultimate fate of these two operations, ventrofixation and ventrosuspension, cannot yet be decided. Notwithstanding Muret's good results, the operator who does a ventrofixation thoroughly—so thoroughly as to prevent recurrence of displacement—makes his patient, in the opinion of most gynecologists, run a risk in her subsequent pregnancies. On the other hand, the operation of ventrosuspension is admitted by Wade himself to be insufficient, and requires reinforcing by vaginal repair; in other words, two operations have to be done, and that is a circumstance which calls for consideration, especially as the abdominal one has a mortality, although a small one. The problem of the best operative measures to be taken in uterine retrodisplacements, with or without prolapse, cannot yet be regarded as solved; there may still be a place for the pessary. J. W. B.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

W. G. SYM, M.D., F.R.C.S., AND ANGUS MacGILLIVRAY, M.D., D.Sc.

THE MODERN THERAPY OF PNEUMOCOCCIC INFECTIONS OF THE EYE.

IN a most interesting paper (*Ophthalmology*, October 1914), Dr. Gradle of Chicago states that in dealing with pneumococcic infections of the eye we must first determine absolutely the character of the organism in question. This can be done roughly in a smear preparation, especially in cases of ulcer, but the safest way is the cultural method. Here the technique advocated by Elsching has proved itself the most satisfactory, both in collecting the material and in the amount of growth within twenty-four hours. The author refers to the serum-bouillon culture. In addition to establishing the nature of the organism involved, something as to its virulence may be also detected. According to Kraupa, the prevalent pneumococci of the eye can be divided into three main groups. The first one grows slowly in the form of true delicate diplococci of text-book form, and is highly virulent. The second group grows more rapidly, morphologically is coarser, and is apt to form short chains of four or six members. Staphylococci are frequently present, and the virulence is not as high as that of the first type. The third type grows very rapidly in the form of long chains of many components, closely resembling streptococci, and is of low virulence. These characteristics appear within twenty-four hours, and are of great aid in establishing a prognosis and in determining a line of treatment.

Before speaking of pneumococcic infections proper, the author thinks it would be fitting to insert a few words about the new pneumococcus specific, ethyl-hydro-cuprein. This was discovered by Morgenroth of Berlin in 1911, and introduced into ophthalmology by Goldschmidt in 1913. The drug is a substitution product of quinine, with a very complicated chemical formula. It is as freely soluble in water as in oils, but when absorbed is dangerous, in that it can easily produce a quinine amaurosis. In use in eye diseases, it is best applied in a 1 per cent. solution or ointment, after a thorough anaesthesia of the cornea, as its use is painful. In addition to the specific germicidal power, it produces a long and lasting corneal anaesthesia, but it must not be forgotten that the drug is of use only against the pneumococcus.

Pneumococcic blennorrhœa of the tear sac is not uncommon. In such a condition none of the recent therapeutic methods can be employed unless the tear passage is patent. A stricture that will not allow the passage of syringed fluids precludes either of the two methods to be described. A tear sac blennorrhœa with a patent passage may be treated by syringing with a 1 per cent. ethyl-hydro-cuprein solution daily. Under such treatment the blennorrhœa seldom lasts more than a few days.

In this condition the Wessely procedure is also very successful. This consists in thorough cocainisation of the lower tear punctum and the introduction of a few drops of tincture of iodine into the sac. A special platino-iridium syringe with a small rubber handle, which contains only two or three drops of fluid, is essential for the success of the method. Around the tear punctum must be placed small protecting pledgets of cotton to absorb the overflow of iodine and prevent damage to the cornea. The injection is to be repeated within three or four days, and seldom are more than three or four injections necessary.

Pneumococcic conjunctivitis yields within a very few days to the use of 1 per cent. ethyl-hydro-cuprein in either solution or ointment form. True, the same results can be obtained by the use of silver nitrate and oxycyanide of mercury, but the time required is usually longer.

The most important pneumococcic infection of the eye that we have to deal with is the serpiginous ulcer. Here the degree of virulence made known by the culture is of real importance, although it is necessary to divide these cases into three classes according to the clinical course. In the first class fall those cases of superficial ulcer usually caused by a pneumococcus of a low degree of virulence. The organism has not the power to penetrate deeply into the fairly resistant corneal tissue, and the destructive process is confined to the superficial lamellæ, if it indeed penetrates Bowman's membrane at all. Consequently it is possible to actually kill all of the organisms involved by the use of ethyl-hydro-cuprein, accompanied by the usual therapy of

heat, atropine, elimination, etc. The drug is best used in a 1 per cent. ointment, for that assures a longer contact with the ulcerated area. It is also of importance to use a protective bandage, because of the resultant corneal anæsthesia.

The second and larger class of cases results from infection by a more virulent organism or occurs in corneæ of lesser resistance. In these cases the pneumococci penetrate the corneal epithelium rapidly and cause infiltration of the deeper layers. Ethyl-hydro-cuprein is of less value here, in that it has no power of penetration and only kills the superficial organisms. Consequently it is necessary to resort to more heroic measures, in addition to the usual therapy detailed in all text-books. The steam cautery, first advocated by Wessely, has proved itself of value in this particular class of cases. The results are not as severe or lasting as those of the galvano-cautery, but are equally efficient. In this instrument live steam is carried by a small tube to a metal point, and then carried back along its former course to a discharge tube. The metallic tip is thus kept at a constant temperature of 100° C., and is used to massage the ulcerated area after complete corneal anæsthesia. The ulcer should be vigorously massaged for at least three minutes. A too short use of the cautery leads to a necrosis of the weakly, resistant, corneal lamellæ, but merely to a stupefaction (if that term may be used) of the organisms. Consequently, instead of checking the ulcer, the treatment allows it to spread more rapidly. Of course ethyl-hydro-cuprein should be likewise used to prevent further infection from the surface.

In the third class of cases the disease spreads so rapidly and to such a depth that none of the above-mentioned methods are of any use, and we must immediately resort to the actual cautery. Dr. Gradle personally prefers the galvano-cautery to any of the chemical means, for its use is simpler and surer, and the resultant scar seems to be less dense and more easily absorbed.

So far only the extra-ocular infections have been mentioned, and a brief sketch of a few of the more modern means of treating them has been referred to. The second great division of pneumococic infections is the intra-ocular. With this class our therapy is still at a standstill. Since the introduction of subconjunctival oxycyanide of mercury injections, nothing really efficacious has been published, but great strides have been made in the prophylaxis of such infections.

Elsching and Ulbrich first proved that the majority of post-operative infections are of pneumococic type (or streptococic, for the two are practically identical), and showed that the organisms gained entrance into the eye from the conjunctival sac. Moreover, about 40 per cent. of all normal conjunctival sacs contain pneumococci of a virulent character. The prevention of post-operative infection then merely resolves itself into the question of the sterility of the conjunctival sac,

and the recent statistics from the Prague Clinic have shown that with clean sacs such infections are nearly entirely eliminated.

But the conjunctival sac cannot be sterilised before every perforating injury, and from such develop the majority of the cases of panophthalmitis. Several years ago Gradle was able to prove that the ingestion of hexamethylamine resulted in its excretion in the aqueous humour and the tears, partially as urotropin and partially as formaldehyde. Although the concentration in the aqueous is insufficient to influence an established infection, still the bactericidal power of the drug there is sufficient to prevent the occurrence of any infection, unless organisms of a high degree of virulence gain admittance. But to be of any value, the drug must be administered within a short time after the injury occurs, and large quantities must be given for the first twenty-four hours. This is, of course, not specific towards the pneumococcus, but applies equally well to any pathogenic organism.

A. MACG.

THERAPEUTICS.

UNDER THE CHARGE OF

JOHN EASON, M.D., F.R.C.P.

CEREBRO-SPINAL SYPHILIS.

THE value of the intraspinal injections of salvarsan in the treatment of cerebro-spinal syphilis has already been indicated in a previous abstract. The opinions there expressed have been confirmed by recent papers on the subject, which is of great practical importance. Meanwhile it would be superfluous again to discuss the matter in its various aspects, but it is interesting to note the results that are being obtained. George Draper (*Arch. Int. Med.*, vol. xv. No. 1) summarises his results in twenty-five cases.

In all groups of cases he obtained a very marked clinical improvement. In the spinal types pain is usually relieved. Ataxia is helped in most instances; in a few not very greatly. The bulbar types and those with fairly pronounced psychic disturbances, depending perhaps on meningeal irritation, show marked improvement in symptoms as well as in the reactions of the spinal fluid. The more definite psychic disturbances also may clear up completely, but their spinal fluids cannot in every case be brought to normal. The cell-count has almost always been reduced in them, but the Wassermann test rarely disappears below 0.3 c.c. In some cases, especially those treated with serum salvarsanised *in vitro*, transient numbness in the feet has appeared; in other cases a slight failing in general robustness, which may be an arsenic effect; and in several instances rather severe pains following the intraspinal injection have been seen. In two cases there

was a sudden increase in ataxia following a period of definite improvement. Notwithstanding these undesirable features, the improvement in symptoms in almost all cases is of such striking nature that the method should be given a most careful and thorough study by numerous observers.

It is, however, a procedure which must be carried out with the greatest attention to the detail of technique in all its steps, otherwise serious symptoms may be induced. At present there is sufficient evidence to show that it is unsafe to give more than two, or at most three, consecutive injections of serum to which salvarsan has been added directly. In no case should more than 0.0005 gm. be added. On the other hand, apparently any number of intraspinal injections may be given with impunity when serum salvarsanised *in vivo* is used.

In those cases which do well the rapid and satisfactory improvement may lead to a premature cessation of treatment, for the elaborateness of the procedure arouses an impulse to curtail the number of treatments. So long as the spinal fluid or blood gives a positive Wassermann test, the case must be looked on as one potentially capable of relapse. Treatment must therefore be continued unremittingly until the laboratory tests are persistently negative.

PANCREATIC ORGANOTHERAPY.

Edwin Parvey Kirk (*Arch. Int. Med.*, vol. xv. No. 1, pp. 39-76) gives an excellent historical and experimental paper under this title.

When dogs suffering from chronic pancreatic diabetes are fed with raw pancreas, the glycosuria increases three- or four-fold. Fresh pancreas in human diabetes has given either negative results, sometimes accompanied by slight subjective (psychic) improvement, or else an actual increase of glycosuria. The administration of pancreatin also causes greatly increased glycosuria. Positive results are few and questionable. In one group of cases, however, that of distinctly pancreatic type with deficient fat and protein absorption, there is abundant evidence of improved absorption and general nutrition following the administration of pankreon or of raw sheep pancreas.

With regard to the treatment of diabetes by feeding with acid extracts of duodenal mucosa or secretin, most observers report negative results. Lessened glycosuria, when observed, is almost certainly due at times to a toxic lessening of renal permeability, the hyperglycæmia not being decreased.

Intraperitoneal injections of emulsions of fresh pancreas in depancreatized dogs sometimes causes marked drops in glycosuria due to a reflex decrease of renal permeability from peritoneal irritation. Similar results have not been obtained in human diabetes. Subcutaneous injections of pancreas may cause marked drops of glycosuria in human

diabetes and in the experimental pancreatic form. The diminished glycosuria is always associated with general constitutional depression or with decreased renal permeability and increase of blood sugar. The evidence is that the diabetes is not ameliorated in any of its aspects. Indeed subcutaneous injections of extracts of almost any organ cause toxic effects and glycosuria. Intravenous injections also give therapeutically disappointing results. Alcoholic extracts give negative results and watery extracts give a transient depression due to a toxic depressor rather than to specific regulator action.

The best criterion in judging of the influence of pancreatic administrations in whatever form is the respiratory quotient, and this remains unaffected.

Experimental pancreatic diabetes is uninfluenced by transfusion of fresh blood or by *vascular* parabiosis. The hyperglycemia is not reduced and the respiratory quotient remains constant. Transfusion of non-diabetic blood in human diabetes was done and careful observations carried out by Raulston and Woodyatt (*Journ. Amer. Med. Assoc.*, 1914, vol. lix. p. 996). The result was a marked late increase of dextrosuria and ketonuria. They believe the method to be definitely contra-indicated in severe diabetes.

Biedl (*Innere Sekretion*, 1913, 2nd ed. pt. ii. S. 360) concludes, on the basis of original experiments, that intravenous and subcutaneous injections of lymph tend to lower the dextrose-nitrogen ratio.

Carrel (*Internat. Soc. Surg.*, New York, April 1914) has shown that homotransplantations and heterotransplantations of pancreas are never viable. Experimental auto-transplantations are often viable. These auto-transplants are functionally successful, but the fact has no therapeutic significance. Really positive results of opotherapy have receded as the criteria have become more exacting. As to the influence of pancreatic opotherapy on ketogenesis, the literature is scanty. Salomon (*Berl. klin. Woch.*, 1902, Bd. xxxix. S. 45) observed an increase of acetonuria after the administration of pankreon in a case of pancreatic diabetes. Mosenthal (*Arch. Int. Med.*, 1912, vol. iv. p. 339), in a single case of human diabetes with evidence of pancreatic degeneration, found that on a regimen of raw sheep pancreas the urinary ammonia was greatly increased, viz. from 2.2 grms. on ordinary diet to about 5.2 grms. after the exhibition of pancreas. This use was associated with a corresponding increase in ketonuria, the β -oxybutyric acid rising from 2.2 grms. to 32.1 grms. Mosenthal's observations were clinical and in a particularly severe case. It became necessary to interfere with the experiment, so that the observation is incomplete. The opotherapy had to be frequently interrupted, but it is important that in this case the administration of raw pancreas gave rise to a tremendous ketonuria in a case of undoubted pancreatic diabetes. During the administration there was a marked general improvement and an increased utilisation of

fats, and "the stools changed from those typical of pancreatic disease to what appeared to be normal movements."

Raulston and Woodyatt found that direct transfusion of blood from normal to diabetic never increased ketonuria. The observations of Salomon and of Mosenthal on the effect of pancreatic therapy on ketonuria in human pancreatic diabetes have to be considered side by side with the results obtained by Kirk in an elaborate series of animal experiments. From these he concluded that pancreatic feeding gives rise to increased ketonuria.

There was nothing in the behaviour of his animals to lead him to suspect that ketones were being generated and accumulated before the administration of pancreas and that the latter simply increased their excretion. The toxic symptoms, moreover, appeared with and increased in proportion to the development of ketonuria. In several of them real coma developed. It is probable that pancreatic feeding may to some extent augment ketogenesis by determining increased absorption of fat and proteid, chiefly the former. The ketogenesis is much greater than that produced by feeding with other proteids, liver muscle, etc. The ketogenesis is probably in the largest degree a toxic action, directed chiefly towards the hepatic functions.

It can be concluded that pancreatic opotherapy in diabetes is a failure, but the administration of unheated pancreatic emulsions and extracts improves the absorption of fats and proteids in pancreatic cases. Both glycosuria and acidosis are, however, increased.

Treatment by opotherapy is only continued because of the strong theoretical inducement.

J. E.

NEW BOOKS.

Operative Surgery. By EDWARD H. TAYLOR, Professor of Surgery in the University of Dublin (Head and Neck, Thorax and Abdomen). Pp. xi. + 524. With 300 Illustrations. London: J. & A. Churchill. 1914. Price 30s. net.

WE are not paying the author a conventional compliment when we offer him our hearty congratulations on the appearance of his new work on operative surgery. It is a contribution to surgical literature which reflects credit on British surgery as a whole, and which will maintain, and even enhance, the high reputation of the Dublin School of Surgery. Professor Taylor, wisely we think, has limited himself to the operations which are most frequently required in general surgical practice, and has given a detailed and consecutive description of these in such a way as to furnish a reliable guide to the student in a course of operative surgery, or to the young surgeon in the earlier days of his operative work. To the experienced surgeon also the work is of value, as it reflects the practice of one who has obviously devoted considerable attention to practical details, and who has selected his methods after carefully weighing the merits of the various procedures recommended by his confrères. Short commentaries are appended to many of the descriptions, and alternative methods are frequently suggested and criticised. While the author describes at length the particular operation he personally prefers, he is in no sense dogmatic in his teaching.

If we were to select any sections for special praise, they would be those on the skull and brain and those on abdominal surgery, but such discrimination is perhaps invidious, as the whole work is of outstanding merit.

It is impossible to avoid making special reference to the illustrations. The majority of these are drawn from Nature by Mr. James T. Murray, which sufficiently bespeaks their anatomical accuracy and artistic excellence. In the production of the volume the publishers have risen to the high standard set by the author and artist.

We trust that Professor Taylor will be encouraged to deal with the operative surgery of the extremities in a subsequent volume and so complete one of the best treatises in the English language.

Indispensable Orthopedics. By F. CALOT. Translated from the Sixth French Edition by A. H. ROBINSON and LOUIS NICOLE. Pp. 1175. With 1260 Illustrations. London: Baillière, Tindall & Cox. 1914. Price 21s. net.

THE somewhat unusual title of this work furnishes a clue to the spirit in which it is written. It is essentially dogmatic, and whatever the

author has to say on the subject is "indispensable." It begins with "The Hexalogue, or the six commandments of orthopædics: (1) Early diagnosis; (2) immediate treatment; (3) perseverance in treatment; (4) the preparation of well-fitting plasters; (5) in the correction of tuberculous deformities to reduce traumatism to a minimum; (6) to guard against operating upon the tubercloses; never to open cold abscesses, but to puncture and inject them." Each of these *dicta* is then elaborated with a wealth of leaded and italic type which almost carries conviction.

Then follows a chapter, extending to nearly 100 pages, on "Indispensable Notions on the Preparation of a Plaster," in which no detail is too small to be excluded; even the method of putting on a new stocking is fully described and illustrated. It must be confessed that this long chapter contains a great deal that is most useful with regard to the application of plaster bandages and cases, but we venture to think we could have dispensed with some of the elaboration.

The third chapter deals with "The Technique of Punctures and Injections." The author mercifully gives a summary of the technique, with a footnote to the effect that "If you are pressed for time, content yourself with reading this summary . . . returning later to the reading of the entire chapter." We must add, however, that the reading of the entire chapter well repays the time spent on it.

Needless to say, the subsequent chapters devoted to the treatment of tuberculous lesions and the deformities resulting therefrom are full of valuable information, based on the author's exceptional experience of these conditions.

Non-tuberculous deformities are also dealt with, and the author's individuality is always in evidence. This is how he begins his description of the local treatment of scoliosis by medical gymnastics: "Oh! do not be afraid, it is very simple. You need not have been born at Stockholm, nor assume an inspired look, to know that a curved arc is reduced by traction on its two extremities and by pressure made on its convexity."

The author is all against operation for tuberculous cervical adenitis, and makes out a very good case for his attitude. This section may be commended to those who favour extensive dissections in spite of their resultant scars and recurrences.

Altogether we have found this a most stimulating book. It is not always possible to agree with the author, but at least he compels one to think before disagreeing, and the result is usually an approximation to his views and a resolve to try his methods.

It only remains to be said that the translators have succeeded admirably in retaining the lightness of touch of the original.

Abdominal Surgery: Clinical Lectures for Students and Physicians. By THORKILD ROVSING, Copenhagen. Edited by PAUL MONROE PILCHER, New York. Pp. xii. + 477. With 136 Illustrations. London and Philadelphia: J. B. Lippincott Co. 1914. Price 21s. net.

In this volume we have a series of twenty-five clinical lectures, for the most part dealing with the surgery of the alimentary canal, which Professor Rovsing has delivered to his class of clinical surgery in the University of Copenhagen. The author has for long occupied a prominent place amongst the great surgeons of Europe, and this presentation of his views on a department of surgery to which he has devoted special attention is of great value. He is happy in the form he has chosen to put forward his opinions, as the clinical lecture lends itself in a special degree to the personal study of disease. Not only have we the living patient before us as we listen, or at least in the mind's eye as we read, but we have the individuality of the teacher directly brought to bear on the problems presented by the case under consideration. Professor Rovsing has avoided the mistake so common in published clinical lectures, of smothering the essential points in the case amongst a mass of unessential details. His clinical histories are short, clear, and to the point, and the reader has no difficulty in carrying them with him as he follows the lecturer's exposition. From his extensive experience he is able to cite numerous typical and atypical cases of each of the conditions he takes up for consideration, and to formulate authoritative opinions on the debatable issues raised.

To the senior student, as well as to the practitioner, this work can be thoroughly recommended. The reading of it is not a task but a recreation.

Diseases of the Kidneys, Ureters, and Bladder, with Special Reference to the Diseases of Women. By HOWARD A. KELLY, M.D., LL.D., and CURTIS F. BURNAM, M.D., Johns Hopkins Hospital, Baltimore. Vol. I, pp. 582; Vol. II, pp. 652. With 632 Illustrations. New York and London: D. Appleton & Co. 1914. Price 50s. net.

KELLY AND BURNAM'S work on *Diseases of the Kidneys, Ureters, and Bladder* is an outstanding example of what a good text-book should be; there is not so much science in it that the practical side is lost to view, neither does the practical part lack the scientific details which are necessary for its rational understanding and intelligent application. For instance, there are admirable chapters on the topographical anatomy of the lumbar region, on the embryology of the urogenital apparatus, and on the physiology of the urinary organs, which the strictly practical man may feel tempted to omit; he will do so to his

own great loss. Even the part dealing with embryology should be carefully perused, for if there is one novel fact which emerges from the study of this volume, it is the immense importance for the urologist of the investigation of the development of the organs which he is handling. If anyone incline to doubt this fact, let him read the chapters on embryology and post-fœtal development immediately before he studies those on hydronephrosis, polycystic kidney, maldevelopments of kidneys and ureters (especially those of the renal pelvis and ureters), diverticulum and exstrophy of the bladder, and malformations of the urethra, and his hesitation to believe will vanish. So, too, the physiology of the kidneys is in direct practical relationship to the understanding of the new methods of examination of the functional capacity of these organs, by means of cryoscopy and the phenolsulphonaphthalein test. On the other side, the surgeon seeking for a thoroughly clear, complete, and yet compact account of any of the diagnostic procedures (*e.g.* cystoscopy, ureteral catheterisation, X-ray work), or of any of the operations old or new (*e.g.* for vesical fistulae, for malignant tumours of the kidney, or for epispadias and exstrophy), will not be disappointed. There is throughout a full presentation of the most modern methods without the expression of extravagant hopes regarding them, as is well seen, for example, in the chapter in which the surgical treatment of Bright's disease is considered. Max Broedel's fine illustrations play a no inconsiderable part in placing this work in the front rank of books on urology. We have given praise freely to the manual, but we sorrowfully make an exception for one or two slips in style which are most regrettable. Thus Professor Kelly, speaking in the preface of his object in writing these two volumes, says, "No other work has been written which does more than squint at urology from the standpoint of the female sex. We have frankly taken this aspect of the subject as our fundamental position, and have done our squinting in the direction of urological problems in the male." One cannot regard such a passage as happily or clearly phrased; even as a colloquialism it is sadly lacking in grace.

Diseases of the Labyrinth: A Clinical Study of the Serous and Purulent Diseases of the Labyrinth. By ERICH RUTTIN, Vienna. Authorised Translation by HORACE NEWHART, M.D., Minnesota, U.S.A. Pp. 230. With 25 Illustrations. London: William Heinemann. 1914.

THIS is by far the best work on diseases of the labyrinth which has appeared up to the present time, and gives the results of the author's wide experience of the clinical aspect and operative treatment of labyrinthitis. As Ruttin himself says, he has watched "this nystagmus business" from the beginning, and for many years has demonstrated

the subject of labyrinthine disease to large classes of post-graduates—indeed the book is only an amplification of his excellent lectures. The first chapter takes up the subject of the functional examination of the ear, and explains the production of nystagmus by rotation and caloric irritation. The explanations and diagrams are exceedingly simple, recalling those of Mr. Hilaire Belloc in regard to the present war. The second chapter deals with the subject of labyrinthitis from the pathological and clinical aspect. One is only sorry that Ruttin did not include reproductions of his beautiful microscopic preparations of labyrinthine suppuration, but perhaps this was hardly to be expected in a book dealing with the clinical aspect of labyrinthitis. In the second chapter we also find the indications for the labyrinth operation and some excellent diagrams showing the technique of this procedure. Chapter III. deals with injuries of the labyrinth, and Chapter IV. with serous-induced labyrinthitis. Chapter V., on labyrinthitis and brain abscess, shows that there is little or no connection between these two conditions, as out of 108 cases of labyrinthitis there were only four with cerebellar abscess and four with abscess of the temporo-sphenoidal lobe. The latter were admittedly not due to labyrinth suppuration. The rest of the volume (132 pages) is occupied with the case records of 108 patients. Each record contains an account of the history, state on admission, results of functional examination, an account of the operation performed, and a detailed after-history of the case. In the fatal cases details of the post-mortem examination are also given. It is interesting to note that of 108 cases 83 were cured and 25 died. Of the cured cases seven were not operated on, in 38 only the radical mastoid operation was performed, and in 38 the labyrinth operation in addition to the radical mastoid. Of the 25 cases in which death occurred only one was not operated on; in five the radical operation alone was performed, and in nineteen the labyrinth operation in addition to the radical. In twelve of the fatal cases the cause of death was purulent meningitis, but in eight of these the meningitis was already present before operation.

On the whole the translation of the work is satisfactory, but "nystagmus to the well side" (p. 94) is not good English—or should we say American?

Practical Medical Electricity. By ALFRED C. NORMAN, M.D., Sunderland. Pp. viii. + 226. With 50 Illustrations. London: The Scientific Press. 1914. Price 5s. net.

Of the smaller manuals on the subject of medical electricity, this one will prove of value to those for whom it appears to have been written—the senior student, the house-surgeon, and the practitioner. It is thoroughly accurate, concise, and up to date. Part I. treats of apparatus and technique, and the relationship between voltage,

ampèreage, and resistance is carefully and lucidly explained. Part II. deals with X-rays, and the arrangement of this section is rather better than that of the usual text-book on the subject. The book throughout is well written; the chapters are for the most part short and to the point.

A Text-Book of General Embryology. By WILLIAM G. KELLICOTT. London: Constable & Co. 1914. Price 10s. 6d. net.

Outlines of Chordate Development. By WILLIAM G. KELLICOTT. London: Constable & Co. 1914. Price 10s. 6d. net.

THE books whose titles are given above are excellent elementary manuals. The first gives a good description of the general principles underlying embryology, and treats clearly and simply of the structure of the cell and of the germ cell, maturation, fertilisation, and some aspects of heredity.

The second gives the special development of amphioxus, the frog, chick, and some mammals, using these types in the way Rolleston and Huxley and Martin began.

Both can be highly recommended to students as accurate, modern, and well illustrated.

Laboratory Manual of Qualitative Analysis. By A. R. BLISS, Jun., Pp. iv. + 244. Philadelphia and London: W. B. Saunders Co. 1914. Price 8s. 6d. net.

THIS book conducts students of medicine, dentistry, and pharmacy through a useful and, on the whole, a judiciously chosen course of elementary qualitative analysis. The reactions of the various cations and anions are clearly stated, and, following the descriptions of the tests for each analytical group, tabular and other instructions of a trustworthy character are given for the separation and identification of the members of the groups. Lists of "compounds and preparations" related to the various metals, etc., form a useful feature, but as many of the substances mentioned are United States Pharmacopœia preparations, they are not all of great importance to students in this country. The inclusion in the index of the substances mentioned in these lists would have rendered the information given about them more easily accessible. A considerable part of the book is printed on one side of the paper only, and, as the paper is of very good quality, the unprinted side is available for students' notes and additions. The American spelling of the word "thru" has an unfamiliar appearance, and there seems to be some want of system in a reformed spelling which includes "oxid," "iodin," and a "deposite." We noted a considerable number of misprints—mostly unimportant.

NEW EDITIONS.

Essentials of Human Physiology. By D. NÖEL PATON, M.D., B.Sc., F.R.C.P.(Edin.), F.R.S., Professor of Physiology, University, Glasgow. Fourth Edition. Pp. 557. With 213 Illustrations. Edinburgh and London: W. Green & Son, Ltd. 1914. Price 12s. net.

A CAREFUL perusal of Paton's *Essentials of Physiology* leads to the conclusion that it continues to fulfil the purpose the author originally intended it to serve; and the fact that it has reached its fourth edition is evidence that its popularity amongst students of medicine is well maintained.

The general exposition of the subject is much the same as in the previous edition; but a good deal of new and important material has been added, and the book brought thoroughly up to date. The work of Pavloff and the X-ray observations of Hertz in relation to digestion receive adequate consideration, but no reference is made to the side-to-side or pendulum movements of the intestines, unless the author considers the latter to be a modified form of the segmental.

A very important addition to the present edition is the section on the chemical and nervous regulation of metabolism by means of the secretions from the ductless or, as Professor Paton prefers to call them, endocrinous glands. His observations on their embryology, connections, and functional activity throw much light on some obscure questions of pathology; and the connection between thymus insufficiency and rickets, pituitary secretion and giantism, deficient thyroid action and failure of bony development, are highly suggestive, and give promise of practical therapeutic benefit, both in medicine and surgery.

Professor Paton's book can be cordially recommended to the student of medicine as an excellent introduction to the study of physiology.

A Manual of Physiology, with Practical Exercises. By G. N. STEWART, M.A., D.Sc., M.D.(Edin.), D.P.H.(Camb.), Professor of Experimental Medicine in Western Reserve University, Cleveland. Seventh Edition. Pp. 1132. With 468 Illustrations. London: Baillière, Tindall & Cox. 1914. Price 18s. net.

THE general scope and arrangement of Professor Stewart's work is much the same as in previous editions, but much new material has been added, and former views and chapters elaborated and extended. When treating of the circulating liquids of the body, a good account is given of anaphylaxis, and reference is made to certain pathological relations, and their bearing on ordinary ailments. In describing the pulse tracings to be obtained from the internal jugular vein at the root of the neck, doubt is expressed as to the correctness of the usual

interpretation of the second positive wave, and reasons are adduced for its being named systolic (s) instead of carotid (c) in the phlebogram. The account of the automatic action of the heart is judiciously written, and due consideration given to the work of His, Kent, and Keith; but whether the rhythmical power is neurogenic or myogenic in origin is left an open question. The work of Sherrington on the principle of the common path, spinal dog, and reflexes generally, is fully recognised and well described.

While this is hardly a book for the junior student, being considerably above his requirements, it can be confidently recommended as a full and scientific exposition of physiological science for those going up for higher examinations, and also to practitioners who wish their practice to be firmly founded upon the Institutes of Medicine.

NOTES ON BOOKS.

Nursing in War Time, by M. N. Oxford (Methuen & Co., Ltd., price 1s.), "is intended for the use of those women who by the fortunes of war may find themselves obliged to undertake the care of the sick and wounded without previous knowledge of the art of nursing." It admirably fulfils its purpose. *A War Cookery Book for the Sick and Wounded* (T. Werner Laurie, Ltd., price 6d.) has been judiciously compiled by Jessie M. Laurie from various well-known cookery books. *The Soldiers' English-French Conversation Book* and the companion *English-German Book* (same publisher, price 7d.) may in turn prove useful as the war progresses. *Thou Art the Man*, by Sidney Dark (same publisher, price 1s.), is a scathing indictment of the principal figure in the present European upheaval, and only calls for mention here as a study in morbid psychology.

ANALYTICAL REPORTS.

A SIMPLE METHOD OF STERILISING WATER.

TABLOID WATER STERILISER.

(BURROUGHS WELLCOME & Co.)

THE importance of ensuring that all water to be used for drinking purposes has been freed from typhoid, dysentery, and cholera contamination cannot be exaggerated. When this cannot be quickly and conveniently effected by means of heat, a chemical method must be employed. Many methods have been tried, but most are subject to the objection that they are uncertain, and are liable to leave a disagreeable taste in the water. A method has been devised which is at once simple and efficient. Sterilisation is effected by means of chlorine set free in the water from chlorinated lime. The free chlorine is subsequently eliminated by means of sodium thio-sulphate. Messrs. Burroughs Wellcome & Co. have placed on the market tabloids of chlorinated lime and of sodium

thio-sulphate which render the practice of sterilisation extremely simple, as one tabloid of chlorinated lime deals with 10 gallons of water, and one tabloid of sodium thio-sulphate removes all taste of the steriliser. Soloids of potassium iodide and starch are supplied to test the presence of free chlorine, and ensure efficiency of sterilisation. The whole process does not occupy more than a quarter of an hour.

BRITISH-MADE SUBSTITUTES FOR GERMAN DRUGS.

Against the general convenience of short trade names for therapeutic preparations, the chemical equivalents of which are too cumbersome for general use, is the fact that a particular trade name frequently comes to stand for all preparations of a similar kind. German manufacturers have been singularly successful in placing on the market useful synthetic preparations with an easily remembered name. At the present moment, for obvious reasons, there is a special activity amongst chemical manufacturers to replace certain of the German products which have established themselves in this country, by preparations of similar composition and equal chemical purity. To the manufacturing chemist there seems to be little difficulty in producing such equivalents. His main difficulty appears to be to find a suitable name under which to sell them. The ingenuity displayed in this direction does not always succeed in enabling us to recognise old friends under new names. It is possible, however, that a short practical acquaintance with the home-made article will enable us to appreciate its value and to overcome the difficulties of nomenclature. The British Drug Houses Limited have submitted to us samples of three new preparations designed to replace specialities of German origin.

IODATOL.

This is a variety of iodised oil which may be prescribed to patients who do not tolerate potassium iodide even in small doses. It is supplied in three strengths, which respectively contain 10 per cent., 20 per cent., and 25 per cent. by weight of iodine in organic combination with the oil. A similar preparation—under the name of “iodipin”—has had a considerable vogue for some years.

URO-SOLVENE.

Uro-solvane is a combination of hexamine and lithium benzoate. The lithium benzoate has been made to replace the sodium acetate contained in “cystopurin,” as hexamine is a type of urinary antiseptic, which is most efficient when the urine has an acid reaction, formaldehyde being liberated in the bladder by the splitting up of the hexamine molecule, and lithium benzoate increases the acidity of the urine, which sodium acetate does not. The drug is sold in the form of tablets—uro-solvettes—and is indicated in the treatment of gonorrhœa, cystitis, and other septic conditions of the bladder and urinary tract, as well as a solvent of uric acid.

SANUSIN.

This is a compound of resorcin, boric acid, balsam of Peru, zinc and bismuth carbonate, put up in a special form of suppository—the sempule—and useful in rectal, anal, and vaginal conditions. It is specially applicable to inflamed and irritable hæmorrhoids.

ENDOLYTIC TUBES FOR CLINICAL DIAGNOSIS.

(FLETCHER, FLETCHER & Co.)

Specimens of these tubes for urine testing at the bedside of a patient have been submitted to us by the makers. The technique has been improved, and its details are set out in an explanatory pamphlet which accompanies the endolytic tube. After a considerable experience in using these tubes, we have come to regard them as most useful. The collection of samples of urine in bottles, carrying them home, and testing them in the ordinary way is always rather a trouble, and will be saved to a large extent if these tubes are used, as a preliminary at least, in the patient's house. The tubes are somewhat larger than an ordinary vaccine tube, and are sent out sealed, filled with various reagents for albumen, sugar, acetone, and diacetic acid. Qualitative testing is a matter of extreme simplicity. A drop of the urine is placed on a clean piece of paper and allowed to run by capillary attraction into the tube containing the test reagent. In the case of the Fehling the mixture is then heated with a match flame. The reactions are extremely delicate, and a dozen tubes or more can be carried in a small metal tube scarcely larger than a thermometer case. Besides Fehling, the tubes supplied contain salicyl-sulphonic acid (for albumin and albumose), ferric chloride (for diacetic acid), and sodium nitroprusside and ammonia (for acetone). In the last-named a crystal of washing soda must be added to the drop of urine, to set free nascent ammonia in the tube. By a simple yet ingenious device an approximate estimation of the percentage of glucose present can be arrived at by the endolytic tube. Altogether, we think that the endolytic tubes deserve to be better known than they are at present, and have pleasure in noting them in this column. They are very moderate in price.

BOOKS RECEIVED.

- ARCHIVES of the Middlesex Hospital. Clinical Series, No. XIV., Vol. XXXII., 1914
(Murray & Co., Ltd.) —
- BULLER, H. The Soldiers' English-German Conversation Book . (T. Werner Laurie, Ltd.) 7d.
- CLARK, HILDA. The Dispensary Treatment of Pulmonary Tuberculosis
(Baillière, Tindall & Cox) 15s.
- DARK, S. Thou Art the Man (T. Werner Laurie, Ltd.) 1s.
- HURRY J. B. The Vicious Circles of Neurasthenia and their Treatment (J. & A. Churchill) 3s. 6d.
- LAURIE, J. M. A War Cookery Book for the Sick and Wounded (T. Werner Laurie, Ltd.) 6d.
- MORRIS' Human Anatomy. Edited by C. M. Jackson. Fifth Edition (J. & A. Churchill) 30s.
- NASH, J. T. C. Evolution and Disease (J. Wright & Sons, Ltd.) 3s. 6d.
- OXFORD, M. N. Nursing in War Time (Methuen & Co., Ltd.) 1s.
- PARSONS, J. H. An Introduction to the Study of Colour Vision
(Cambridge University Press) 12s. 6d.
- QUAIN'S Elements of Anatomy. Vol. IV., Part I. Eleventh Edition
(Longmans, Green & Co.) 12s. 6d.
- TRANSACTIONS of the American Gynecological Society, 1914. Vol. XXXIX. (W. J. Dornan) —
- TRANSACTIONS of the Thirty-Sixth Annual Meeting of the American Laryngological Association, 1914 (New York) —
- WILSON, T. S. The Early Diagnosis of Heart Failure (Smith, Elder & Co.) 12s. 6d.

EDINBURGH

MEDICAL JOURNAL.

EDITORIAL NOTES.

**The University
and the
Teaching Hospitals.**

IN view of the successful negotiations between the University and the Royal Infirmary, whereby the staff of the latter institution have been brought into more direct relationship with the University, and clinical teaching has been correspondingly reorganised and improved, it is natural that other institutions should feel constrained to follow suit. In the Sick Children's Hospital, on the resignation last year of Dr. Carnegie Dickson, the directors wisely decided that in future the pathological work of the Hospital should be divided between pathological and bacteriological departments, having at their heads Professor Lorrain Smith and Professor James Ritchie as consulting pathologist and consulting bacteriologist respectively. The work of the two sections is now carried on partly in the Hospital laboratory and partly in the University by members of the University staff appointed and paid by the directors for the purpose. As the ordinary members of the medical staff are already University lecturers, the new plan increases the bonds between the two institutions, and will prove reciprocally beneficial by enriching the material for teaching in the University and economising laboratory equipment in the Hospital.

Negotiations on analogous lines are, we understand, in progress between the Maternity Hospital and the University, the main object being, of course, to increase the facilities for teaching midwifery, and, incidentally, to check the efflux of students to Dublin and elsewhere. Towards the end of last year, when Dr. Barbour's term of service expired, and there happened also to be a break in the periods of appointment of other two physicians, the suggestion was made that for the old system of quarterly rotation for fifteen years there should be substituted one period of full charge for five years, and that to facilitate the change the vacancy on the staff should not be filled up in the usual way. This scheme, however, was opposed by practically the whole staff, and it seems very unlikely that it will come to pass in the near future. Indeed, desirable as it might be from some points of view, it is difficult to see how it could be carried into effect without injustice to the present

physicians and assistant physicians. To allow of full discussion, however, the directors have filled the vacancies by temporary appointments and re-appointments of only one year instead of the customary five years.

As matters stand at present the Professor of Midwifery holds office in the Maternity Hospital during his tenure of the Chair, without age or time-limit. The other three physicians hold office for fifteen years; there are also assistant physicians appointed by the directors, and extern assistant physicians—the obstetric physicians to the dispensaries. The last, who are appointed by the dispensaries, not by the directors, hold office in virtue of an arrangement with the dispensaries whereby the patients attended from the dispensaries are regarded statistically and from a teaching point of view as hospital cases. The position is further complicated by the fact that much of the hospital material (in all, about 2500 patients are delivered annually) is utilised for the teaching of nurses, which is a benefit to the Hospital, inasmuch as the institution is thereby staffed gratuitously, and to the physicians, who receive the nurses' fees, but is detrimental to University interests, as the material available for students is much diminished. On the other hand, the Hospital, but not the staff, benefits from the fees of the students.

It appears to us that in a school like Edinburgh the teaching of students must be paramount, and that, important to the community as is the provision of trained midwifery nurses, their claims should not be allowed to interfere with the school's chief function of training doctors. If this be admitted, the question of the relationship of the Maternity Hospital and the University should not prove of insurmountable difficulty. Even under the existing system of rotation there should be little objection to recognising the staff as University lecturers, although we are inclined to think that it might well be considered at the same time whether the incumbent of the Chair of Midwifery for the time being should not have some special privileges—whether in the shape of a less uninterrupted period of acting duty than his colleagues, or otherwise. It is, however, right to say that the rotation system is customary in most maternity hospitals, Dublin being the outstanding exception. One benefit which the clinical teaching of midwifery would derive from a closer union with the University, and which should be weighed against any loss of revenue from nurses, is that grants from the Carnegie Trustees would become available. The interests of the extra-mural student could be safeguarded as they are in the clinical classes of the Royal Infirmary.

Although we regret that the directors of the Maternity Hospital have, without any reason given, departed from the sound principle of throwing the recent vacancy in the assistant staff open to competition, we think it was not unwise to make only temporary appointments, so that the whole future system of staffing may be thrashed out without

prejudice. We hope that some mutually beneficial arrangement between the University and Hospital will be arrived at.

A further development of the Hospital's activity, in the shape of consultations for expectant mothers, and infant consultations, is contemplated. Both are obviously steps in the right direction: the former is in continuity with the prematernity work already begun in the Hospital; the latter will, we anticipate, be carried out in co-operation, not rivalry, with the infant consultations which already exist in several districts of the city, and we hope that it will be found possible to associate with them services of the voluntary health visitors, and to prolong the supervision of the cases beyond the age of infancy.

CASUALTIES.

KILLED on active service in France on 17th February, Lieutenant DONALD CAMPBELL, R.A.M.C.

Lieutenant Campbell was a graduate in Arts of Edinburgh University, and in 1913 he obtained his degree in Medicine. In both faculties he gained important prizes, and he held various resident hospital appointments before joining the Royal Army Medical Corps.

DIED at Kragujevatz, Servia, on 14th February, Dr. ELIZABETH NESS MACBEAN ROSS.

Dr. Ross graduated M.B., Ch.B., in the University of Glasgow in 1901. After holding various appointments at home she went to Persia, where she worked in Ispahan. She subsequently volunteered for service in the typhus wards at Kragujevatz in Servia, and in the course of her work there she contracted the disease which proved fatal.

KILLED at Singapore, on 24th February, Dr. ANGUS FORSYTH LEGGE, Colonial Medical Service.

Dr. Legge was a graduate of Aberdeen University, where he took the degree of M.B., Ch.B., in 1912. He had recently gone to Singapore.

DISTINCTION.

LIEUTENANT ERIC CHRISTISON LANG, M.B., Ch.B., R.A.M.C., has received the Distinguished Service Order in recognition of his gallantry whilst serving with the Expeditionary Force.

Lieutenant Lang graduated M.B., Ch.B., in the University of Edinburgh in 1910. The Distinguished Service Order was awarded him for conspicuous gallantry and devotion to duty on two occasions, especially on 9th February at Rue de Bois in rescuing a severely wounded officer under very difficult circumstances whilst in view of the enemy.

THE NEW PSYCHIATRY.*

By W. H. B. STODDART, M.D., F.R.C.P.(London).

LECTURE I.

FUNDAMENTAL PSYCHICAL MECHANISMS.

IN respectful response to your kind invitation I have decided to expound the principles and practice of psycho-analysis rather than to weary you with crude trivialities of my own; for, in the domain of mental disease, this new psychiatry, which has not yet received sufficient recognition in this country, is one of the most important problems of the day. I have set myself the difficult task of compressing into the space of three hours the substance of a vast literature on an intrinsically difficult subject, concerning which a complete doctrine has not yet been elaborated, although an enormous amount of patient labour has been expended upon it during the last twenty years.

Psycho-analysis has, of course, met with captious criticism, the inevitable destiny of a new truth, but this has been especially severe in the case of our new psychiatry for four reasons:—

1. The critics do not read psycho-analytic articles, or they do so only superficially, so that they arrive at quite extraordinary misconceptions.

2. Not one of them has given the method a full and practical trial.

3. Basing their criticisms upon sentiment and prejudice, they assume an attitude of moral indignation or haughty contempt, seeking an answer to the question "Are these principles to my liking?" instead of the question "Are these principles true?"

4. The critics have been somewhat justified in that a number of medical men, especially in Germany, practise, in various sanatoria and in private, what they conceive to be psycho-analysis, without having attempted to master the subject, with the result that they have done their patients more harm than good by filling their minds with all sorts of filthy ideas and making the most objectionable suggestions by way of therapeutic advice. I need hardly say that such charlatans, for they are neither more nor less, have through their ignorance brought discredit upon the new psychiatry which it does not deserve; for their methods, as I hope to show, are the very antithesis of those of psycho-analysis.

* The Morison Lectures, delivered in the Royal College of Physicians, 8th, 10th, and 12th March 1915. (Abridged.)

Instinct.—In order to gain a clear insight into the principles of abnormal psychology, let us by way of preliminary examine the human instincts.

Instinct is the blind prompting in an animal to act without deliberation in a certain way. An instinctive action is practically perfect on the very first attempt, although there has been no previous education in its performance, and it is of such a nature as to produce certain ends without foresight of those ends. Instincts are perhaps most characteristic among the lower animals. As examples, sexual acts, migration, the first-year bird building her nest and sitting on her eggs, nutrition and care of the young, the lion stalking his prey, and the congregation of certain animals into shoals, flocks, and herds. In man one may instance the first attempts at speech by the human infant, the first attempts to walk, the avoidance of filth, making collections of all sorts of things, seeking the company of the opposite sex, nurture of the young, pulling down the blinds at night, and the congregation into towns and cities. These are but a few examples; but, even if the list were complete, it would be found possible to group all the instincts under two headings, viz. those subserving the function of preserving the individual and those subserving the function of perpetuating the race. They have also been classed into three categories, according as they are moved by the promptings of self-preservation, nutrition, or sex.

The Herd Instinct.—Now Dr. Wilfred Trotter, in two very able articles in the *Sociological Review* for 1908 and 1909, has drawn our attention to the existence and importance of a fourth instinct, gregariousness or, as he calls it, the herd instinct. Although this had long been recognised, it had never before been seriously contemplated and studied. When we come to think of it, man is much more dependent upon communal life than appears at first sight. Left to himself, he is not only extremely miserable, but his faculty of speech is useless to him, and he stands little chance of survival among the other animals. Moreover, his conduct is very largely regulated by the customs of his tribe.

The advantage of gregariousness lies in the homogeneity of the herd, which enables large numbers to act in concert. In hunting and warfare, for example, the benefit of this is obvious, for the prey or enemy is more easily vanquished by a large number of hunters than by a single unit. Such homogeneity is assured by an inherent impulse of each individual to behave in the same way as his fellows, and those who depart from the usual customs

of the herd cease to benefit from the advantages of gregariousness, if they are not actually killed. The herd instinct, like other instincts, is maintained by natural selection.

So it happens that in company there is an unanalysable feeling of comfort, in solitude there is an unanalysable sense of restlessness and discomfort. This is just instinct. Similarly, if we depart from the customs of our particular "set" in matters of dress, amusement, religion, or politics, either we feel uncomfortable or we are regarded as eccentric and ostracised. Stage fright and shyness are the outcome of an instinctive desire to leave one's conspicuous position and to become once more one of the herd.

Dr. Bernard Hart has drawn my attention to a latter-day exemplification of the influence of the herd instinct in the fact that a man who worries about the ultimate result of the war ceases to do so when he has enlisted in Kitchener's Army. He has the unconscious feeling that he is within the fold.

Again, man is readily prepared to accept suggestions which are in accordance with the traditions of his particular herd; but he is disinclined to receive new truths which have been revealed by experience. People refused to look through Galileo's telescope, Darwin was considered a madman, the clinical thermometer was laughed at, people refuse to believe in vaccination or inoculation of any kind, new diseases are figments of the imagination of their discoverers, and psycho-analysis is immoral; because the new must always encounter the opposition of the herd tradition. But it must also be remembered that in such instances herd tradition has to encounter opposition from the new, and may be gradually overcome until the experience becomes incorporated with the herd traditions.

In matters of opinion, however, such as politics, religion, finance, education, art, literature, and all sorts of public problems, the opinions of people ranged on *both* sides are based on herd traditions, and no amount of argument will induce them to see the opposite point of view, or even to adopt the only rational position in such matters, viz. that of suspended judgment. On the contrary, they find more and more justification for the opinions they hold. In other words, belief comes first, reasons for the belief come second. This process is known as "rationalisation." It may, of course, be used in support of, or in opposition to, scientific truths; but even then, "rationalisation" is dependent on the herd instinct for its existence.

How, then, are we to know whether any opinion we hold is

rational or non-rational? If we find that we base the opinion on the feeling that any inquiry into the matter would be useless, barren, and superfluous, and that it is foolish, impatriotic, wicked, or "bad form" to think otherwise, then it must be regarded as irrational; but if our opinion is based on experience, then it is rational.

We have, so far, been discussing the influence of the herd instinct on intellectual processes, but we shall find that it also lies at the basis of our moral sentiments. Whenever a man does anything which he knows would meet with the disapprobation of his friends, he experiences a feeling of uneasiness, similar to that caused by isolation, solitude, or separation from the tribe, a feeling of guilt; and when he does something which would be applauded by his fellows, he has a sense of happiness and self-satisfaction. This, then, is the basis of the moral sentiment with which the voice of conscience is indissolubly associated. A non-gregarious animal can do what it likes; it has only itself to consider.

There is a fundamental difference between this herd instinct and the personal instincts of self-preservation, nutrition, and sex. These are dependent on the impulse of the moment; but the herd instinct is a controlling force from without, which is perpetually acting in antagonism to the other three. The child is taught from the cradle to respect the feelings of its companions, to resist its own impulses in order to protect others, to comply with their desires, and not to be selfish or greedy. And when the sexual passion asserts itself, he finds that it is antagonised by a very strict code of conduct, with which it becomes his instinct to comply. The whole subject of sex is taboo, and this is one of the chief reasons why psycho-analysis has encountered severe antagonism. For a long time gynæcology was in the same position for a similar reason.

We find, then, that it is instinct which governs the whole of our mental life. Instinct is no more and no less than "psychical energy," the driving force of mentation to which Jung has recently given the name "horme." This word "horme" has a wide signification, applicable to all the instincts, and corresponds with the word "libido" in reference to the sexual instinct.

"Horme" means psychical energy, desire *plus* a conative trend. In short, I conceive it as being more or less synonymous with instinct, the driving force of our mental life. Every individual is endowed with a certain quantity of hormone. Sometimes it is active in one direction, sometimes in another; it is never quiet. Comparable

to physical energy, which may display itself as movement, sound, heat, light, electricity, or chemical action, it is never lost, and the principle of the conservation of energy is to be regarded as equally applicable to both psychical and physical energy. If a certain amount of horne or psychical energy in a given patient appears to be lost, it becomes our duty to discover where it has gone; but I will return to this subject later.

There is, as I have just suggested, a constant play between the instincts, one giving place to another as occasion arises; but when a herd impulse becomes displaced by the driving force of some other instinct, mental conflict ensues: there is a situation to be faced, and a way out of the difficulty must be found. "Twixt Love and Duty" has always been a favourite theme with artists, novelists, poets, and philosophers. If duty fails (that is to say, if the herd instinct fails), some way must be found to pacify the guilty conscience.

The conflict may be resolved in one of four ways: Firstly, the influence of the herd instinct may be recognised and its influence voluntarily ignored, the delinquent avowing to himself that he has a perfect right to do as he likes. The herd instinct is so strong that this process is, as a rule, difficult; but everybody knows that such unscrupulous persons undoubtedly exist.

Secondly, the offence may be condoned by "rationalisation," the offender excusing himself on the ground that he is otherwise a very good fellow. He goes to church regularly, subscribes to the charities, and is a good patriotic citizen—the logical fallacy here being, of course, the *ignoratio elenchi*.

Thirdly, the emotional tone or effect of worry may gradually pass off as years roll by and he becomes occupied with other matters, in just the same way as we do not feel after the lapse of time the loss of a dear friend to the same extent as when we first hear the news of his death.

And lastly, the incident may refuse to become assimilated to the existing content of consciousness and be forgotten. The memory is banished from consciousness, but this does not mean that it is banished from the mind. It means that an attempt is made to repress it into a department of mentation from which it can never again enter phenomenal consciousness and disturb the normal stream of associative thought. Later on we shall have to discuss what happens should this repression subsequently fail, as it very frequently does.

The Unconscious.—This brings me to one of the fundamental

bases of the Freudian psychology, viz. the conception of the unconscious.

At any given moment during a stream of thought there are only one or two ideas present in phenomenal consciousness. Under certain artificial conditions in the psychological laboratory it is possible to demonstrate that as many as six or seven ideas may be present in consciousness at the same time, but in practical thought seldom more than two ideas occupy the field of attention.

In close association with these ideas, however, at what is sometimes called the fringe of consciousness, but outside the field of attention for the moment, there is a much larger number of percepts, ideas, and other mental states. These have been grouped together for practical purposes and called "the subconscious."

There still remains a large number of ideas and memories quite unconnected with the existing content of consciousness and quite outside the field of attention, but capable of recall when required. These are known as the "foreconscious" or "preconscious."

Now there is an enormous number of ideas of past experiences, incidents, and situations which we cannot by any possibility remember, no matter how hard we try. For these there is a lifelong amnesia. Nevertheless, they are not lost. They sometimes flash into the mind in moments of abstraction and during dreams; it is said that they are all passed in review during drowning, and they can be recovered by such artifices as hypnotism, crystal-gazing, and psycho-analysis. This group of ideas is called the "unconscious." The name is perhaps a little unfortunate, because "unconsciousness" has nothing to do with these phenomena, which were recognised in this country long before Freud's day and were described as "unconscious cerebration." I believe that the name was then the chief reason for their non-acceptance, for it was rightly contended that unconscious cerebration is a contradiction in terms. If hybrids were tolerated, I would suggest some such name as "hypoconscious" for such mental states. It is not usually pretended that every incident that has ever happened in our lives is conserved in the unconscious (although Bergson does so), but it would certainly be true to say that all experiences which have been accompanied by a strong affective tone are conserved—even right back into early infancy.

Psychical Determinism.—Another fundamental doctrine of modern psychology is that of "psychical determinism," which postulates that every mental process is predestined and fore-

ordained. According to Jung, such predestination is due to the conscious activity of a higher power, God or world-consciousness; but Freud ascribes it to an unerring scientific law of causation.

While recognising that there are certain characteristic tendencies and reactions, physical and psychical, common to all mankind, and given to us by heredity and evolution (the inherited instincts already mentioned), we must also take into account the fact that the experiences of every one of us differ from those of all other people. Instinct is the driving force which causes *A.* and *B.* to act in the same way when confronted with a given situation, but their thought and action in association therewith are differently carried out because their individual experiences are entirely different. These and other considerations, to be discussed presently, led Freud to the study of "individual psychology," one outcome of which has been the enunciation of the doctrine that for every psychic fact there have been efficient and logical antecedent causative mental states in the present life-history of the individual, and that there is a continuity of mental associations from the cradle to the grave. In other words, there is no such thing as chance in the determination of a thought.

Complexes.—While preparing these lectures, any patient exhibiting a good example of the mental processes I am now endeavouring to explain caused me to think of the Morison lectures, as also did mannerisms of people I met in the street, certain items of information in books, thoughts of the unconscious motives of war and incidents of psychological interest on the battlefield, papers read to less distinguished audiences, mental facts in my own life, and a host of other things. In other words, I have had a "Morison lecture" constellation of ideas. It has not been repressed, and should therefore not be called a complex.

I meet a man in the street who at one time did me considerable injury by reason of certain jealousies, etc. He is the centre of a whole number of ideas of difficult situations and incidents which caused me much perplexity at the time but are now repressed and partly forgotten, but I feel vexed when I see him. This is one of my complexes.

A favourite example is that of a young man in love. His emotional state tends to constellate all his ideas to the one central figure, his lady-love, no matter how remote the association may be. The act of writing at his office desk reminds him of writing to his adored one; a luxurious motor-car makes him think

how she would look in it; a chance resemblance causes him to wonder, "Is it she?": the sermon at church contains many allusions to his love for her, and all Nature echoes his happiness. It is the "love" constellation or complex. In fact, the whole of our unconscious mind is made up of complexes; and the total mass of these, taken together, constitutes the "ego-complex."

A complex, then, may be defined as a repressed system of ideas having a constant conative trend or emotional tone, and directed towards determinate actions and thoughts. A complex is therefore possessed of a certain amount of energy, and, since complexes can generally be referred to some instinct, we may regard this energy as a manifestation of the *horme* we have already discussed. The liberation of this energy by discharge, either by an outburst of emotion or by the fulfilment or realisation of the conative object of the complex, is known as "abreaction." Abreaction of the love-complex, for example, is possession of the desired object of affection.

Conflict.—We are now in a position to consider in rather more detail the phenomenon of "conflict." When there develop in the mind two complexes which are out of harmony with one another, and mutually repel or paralyse each other, conflict ensues. A hypothetical instance of conflict between two nutrition complexes is given in the fable of the animal which died of starvation when, suffering equally from hunger and thirst, it found itself midway between a basket of food and a pail of water. Conflict occurs between two self-preservation complexes when a man finds himself stranded on the High Alps, when inactivity means death from starvation, and an attempt to reach the valley threatens death from precipitation. Conflict arises when a man finds he has fallen in love with two women at the same time. But conflict never arises between a nutrition complex and a sexual complex or between a self-preservation complex and a nutrition complex—unless, of course, the nutrition complex is so urgent (as in the above instance) that it constitutes at the same time a self-preservation complex. Conflict between a sexual complex and a self-preservation one is fairly common, and either may win, as in the question of plunging into a marriage which is inimical to one's life interests or facing death to save a loved one from danger.

In practical experience, however, we find that by far the greatest majority of conflicts occur between a personal complex and a herd complex—that is to say, between morality, religion, ethics, or fashion on the one hand, and nutrition, self-preservation, or sex on

the other. Now the only ways in which nutrition complexes and self-preservation complexes can conflict with the herd instinct are by such crimes as murder, theft, and dishonesty; but there is only one way in which satisfaction of the sexual instinct does not conflict with the herd instinct, viz. by legitimate wedlock.

Sexual aberrations, many of which are exceedingly common, are all under the ban of the herd; and it so happens that we find, as a matter of practical experience, that by far the majority of conflicts, which we find on psycho-analysis to lie at the root of the neuroses and psychoses, are between a sexual complex and a herd complex.

Now a conflict cannot be allowed to persist for ever. It is a biological necessity that some way out of the difficulty must be found. The normal and logical way out of the situation is to face it, to recognise that there is a conflict, to consider what is the right and proper course to pursue and to take that course, at the same time admitting to oneself that such a conflict has existed.

If, on the other hand, the victim refuses to face the situation and attempts to evade it, this may be done, as I have already mentioned, in one of four ways.

Firstly, he may recognise the influence of the herd instinct, and refuse to be guided by it. In my experience this is, as a rule, not very successful. The herd instinct is a true instinct and refuses to be repressed, with the result that the patient suffers from remorse, usually accompanied by an unexplained headache and other neurasthenic symptoms which are very difficult to dislodge.

Secondly, he may seek refuge in "rationalisation," keeping his conflicting personal complex in a "logic-tight compartment" of the mind. The swindling financier refuses to acknowledge to himself that he, as a financier, is the same individual who reads the lessons at church and built the local almshouses, or he condones his swindles with acts of piety and charity. This is an example of what is known as "dissociation" or, as Janet calls it, the "splitting of consciousness." This phenomenon occurs quite commonly when, for example, we converse on one subject and write a letter about another, and it is quite possible for our financier, while reading the lessons, to be at the same time devising some scheme whereby he may succeed in transferring somebody else's banking account to his own.

In pathological domains we observe a similar splitting of con-

sciousness in the general paralytic who, while believing himself to be God Almighty, begs his attendant for a cigarette, or in the asylum queen who is elated in being the chosen patient to wait on the nurses.

Dissociation occurs also during the "automatic writing" of certain hysterical patients. If such a patient be given a pencil and a piece of paper, and be held in conversation while a third person whispers questions into the patient's ear, she will correctly answer the questions by writing, all the while being unconscious of the fact that she is writing.

Another variety of dissociation occurs in the cases of "double consciousness." Here the patient has two entirely different personalities, each being independent and unaware of the existence of the other. Robert Louis Stevenson has dramatised the condition in the familiar play *Dr. Jekyll and Mr. Hyde*, and I need not quote the well-known case of the Rev. Ansel Bourne, reported by James and Weir-Mitchell. Marandon de Montyel placed on record the case of a man who remembered nothing between being about his business in Paris and returning to his normal personality on board a ship bound for Bombay. Records of many similar cases are to be found distributed throughout the literature.

Thirdly, our victim of conflict may allow the energy of his complex to be diverted into other channels than the natural one. This process is called "sublimation," and the best examples are again to be found in the domain of sex.

The old maid has at one time been possessed of a sexual instinct quite as strong as that of her married sisters, but its natural outlet has been denied her. What outlets can she find for her pent-up energy? She devotes much to her dress, which is often extravagant, or she indulges in all sorts of gaieties, or she takes to nursing, or, by a kind of transference, she interests herself in society news, especially of the type to be found in so-called "society newspapers," and she loves to read the details of marriages and scandals. Moreover, her maternal complex has to be satisfied, and she reads the columns of births daily and bestows her maternal affection on cats, dogs, and parrots.

A man may sublimate his sexual instincts into dangerous sports. In the early days of aviation, when it was much more dangerous than it is now, an acquaintance of mine took to this sport when the circumstances of his marriage became somewhat distressing. This sublimation in men also takes the form of academic interests,

increased professional activity, travel, collecting manias, and alcoholic excesses.

Sometimes sublimation takes the form of inversion or representation of the opposite. The old maid, for example, often betrays her sexual complex by extreme prudery, or by devoting herself to excessive religious exercises.

Fourthly, lastly, and most important of all, the conflicting personal complex may refuse to become assimilated to the normal content of consciousness and become forgotten. Perhaps a better way of putting this is to say that the victim refuses to admit to himself that such a complex ever existed. The popular way of expressing this is to say that he "puts it out of his mind," but what really happens is, as we shall see later, that he puts it into his mind, pushes it in deeper into the unconscious or, as we say technically, "represses" it. This is the phenomenon of "repression," really another form of "dissociation" or "splitting of consciousness." It differs, however, from the previously discussed variety in that a complex dissociated by repression has an autonomous existence. There is a constant resistance against the elements of a repressed complex becoming associated with those of phenomenal consciousness. This resistance, which is nothing more than a continuation of the original repression, is called by Freud the "censure," and has been personified by his English and American translators into the "censor."

Now it is clear that it must be a very difficult matter for the normal train of thought to proceed year in and year out without once touching upon some idea which tends to become associated with some element of the repressed complex. Such ideas and other mental states are bound to occur, and, since the "censor" will not allow repressed ideas to enter consciousness, the only possible alternative is that conscious ideas become anchored to the unconscious complex. The result is that the unconscious tends to grow at the expense of the conscious; and it may be taken as a rule that the greater the emotional tone of the original complex, the greater does that complex grow when it becomes unconscious. The fact that the unconscious grows constantly at the expense of the conscious explains why a case of long duration takes so much longer to cure than a case of recent onset.

"Dissociation" and "repression" are closely allied to one another, and it will also be observed that "sublimation" usually involves "repression." The old maid's prudery is an obviously successful method of repressing her sexual complex, and her

fondness for domestic pets subserves the repression of her maternal complex.

It is not to be supposed that sublimation and repression are usually pathological or abnormal. On the contrary, they take place to an enormous extent in the earlier years of us all, and play an important *role* in early education whereby our naturally vicious animal energies are repressed into the unconscious and sublimated into useful moral activities. It follows that our unconscious consists for the most part of infantile complexes, and this accounts to some extent for the amnesia which veils the first years of childhood. It is true that this amnesia is partly due to the fact that many of the cerebral neurons are not yet myelinised, but that this is not the only reason is evidenced by the fact that the amnesia is here and there broken by isolated memories of unimportant incidents. Freud has called these "cover-memories" because they serve to displace memories of important events.

When these repressions or sublimations for any reason fail, we have the conditions necessary for the development of neurosis or psychosis, conflict occurring between the repressed complex and the existing content of phenomenal consciousness. Under such circumstances the complex escaping from depression is distorted and disguised by way of an attempt to render it acceptable to consciousness, and its distorted manifestations constitute the symptoms of the disease. Solution of the difficulty and cure of the disease are accomplished by revealing to the patient through his own association mechanisms the full content of the repressed complex. How this is to be done I will explain in my next lecture.

I have already mentioned that complexes related to the sexual instinct are repressed more than any other. It is, therefore, not surprising to find that these play an enormous *role* in the psychoses, and a knowledge of the development of the sexual instinct is so essential to any comprehension of the new psychiatry that I must discuss this matter in some detail. I ought to say that this knowledge has been gained, in the first instance, entirely through psycho-analysis.

THE SEXUAL INSTINCT.

Those members of my audience who have devoted their attention to the study of disease in children, especially nervous disease, will be the first to admit that sexuality is not a function which suddenly springs into being at puberty, but that it gradually

develops from small beginnings in earliest infancy. Freud considers that sucking the mother's breast is partly a sexual act, but Jung dissents from this view, and considers the act of sucking the breast to be purely nutritive in function.

Now, in adult life many of the sense organs are capable of stimulating the sexual instinct; for example, the eye, the ear, the nose, and the skin; but the centre of maximal stimulus is the genital organ. In the child, however, there is no centre of maximal stimulation to be discovered, the pleasure-arousing area being equally diffused all over the body, and therefore so much the less stimulating in any given zone.

Freud has discovered, however, that even in the young child there are certain areas the irritation of which produces greater gratification than elsewhere. Although these lie at the foundation of the sexual instinct, it is not suggested that the child himself has any idea of the nature and significance of these sensations. These areas, which I am about to mention, have been called by Freud the "erogenous zones."

I have already referred to the mouth.

Another important erogenous zone lies at the other end of the alimentary canal, the anus.

The third erogenous zone is the neck of the bladder.

The fourth erogenous zone is the inner surface of the thighs. Pleasure experienced by rubbing the thighs together is often to be observed in quite young infants, especially females.

The period we have been discussing is characterised by the infant finding a kind of gratification in the stimulation of parts of its own body. About the third or fourth year, however, the whole of this infantile sexuality becomes repressed by education, and it is during this stage of repression, the "latency period," as it is called, that the infantile germs of sexuality become sublimated and applied to refining, cultural, and social ends; but, should misadventure or adversity befall this sublimating process, the child is destined to become the victim of neurosis.

From the fifth or sixth year onwards, in what Jung has termed the "pre-pubertal period," we begin to observe a recrudescence of sexuality, but it differs from the first period in that the child now strives to come into closer relationship with the outside world. The first was a period of "subject-love" or auto-eroticism; this is a period of "object-love," and the child seeks to love somebody other than itself. Naturally, the first object of its affection is the person with whom it is brought into closest relationship, viz. the

mother or the nurse. This is, of course, due to a feeling of dependence, and is therefore very strong. Even as early as this we can discern some psychical differentiation between the sexes, for the boy's love is mostly directed towards his mother and the girl's towards her father. It is also to be noticed that a boy loves his sisters more than his brothers, and a girl loves her brothers more than her sisters.

It is normal for the child to develop curiosity respecting sex and birth processes. Indeed, it is only natural that he should want to know where a new brother or sister comes from, for such a person threatens to displace him and to absorb the love of his mother which has previously been lavished on him.

As I have just hinted, the normal change which takes place at puberty is the erection of incest barriers, whereby the love for the parents becomes gradually weakened as the adolescent becomes attracted to persons of the same age but of the opposite sex. I say "of the opposite sex," but it must be remembered that the sweetheart is of the same sex as the child's first love. Moreover, the parents usually serve as an unconscious pattern for the mates of young people. Boys have a natural inclination to some girl resembling their mother, and girls to some boy resembling their father.

There are some individuals who linger over intermediate sexual attractions, so that their libido becomes permanently fixated on these instead of passing them over rapidly on the way to an ultimate sexual goal.

When these perversities are manifest to any given person and self-avowed, they do no harm to his nervous system; indeed, many perverts have shown themselves to be of exceptional intellectual ability.

Now when conflict arises between a repressed complex and phenomenal consciousness—in other words, when an unconscious complex strives for recognition and consciousness, or perhaps I ought rather to say subconsciousness, endeavours to maintain the repression—neither one nor the other achieves success, and the result of the conflict is a compromise, this being none other than a symptom or group of symptoms of neurosis or psychosis. The discussion of the various mechanisms which come into play in this process I will postpone until the consideration of dreams in my next lecture, for the mechanism of dreams is almost exactly the same as that of the insanities. We shall find that, in its attempt to escape repression, a complex becomes distorted and disguises

itself in such a way that its true nature is not revealed to consciousness.

Some of the infantile complexes to which I have referred will still remain somewhat obscure unless their nature is fully apprehended, and I must revert to the relationship between parents and children as it is unconsciously conceived by the child. As I have already submitted, the mother is the boy's and the father is the girl's favourite parent. Now this means a great deal more than appears at first sight, for it has been established from the study of children, and from the dreams of adults, that the boy's love for his mother is of such a character that he resents sharing his mother's love with anyone else, especially the father. A very large number of boys ask their mother at some time or other whether she loves him or "daddy" the more, and the child usually receives (quite rightly from an educational point of view) a disappointing answer. The boy is jealous of his father, and, similarly, the girl is jealous of her mother. Each, in fact, wishes the parent of the same sex out of the way, and may go so far as to dream of the death of this parent. We shall see in the next lecture that a dream is the realisation of a wish.

This incest-complex, which exists in the unconscious of every individual, normal or abnormal, is known in the case of a man as the *Oedipus-complex*, and in the case of a woman as the *Electra-complex*. *Oedipus* was a king of Thebes who had the misfortune to slay his own father, and, unwittingly, to marry his mother. *Electra* was the daughter of *Agamemnon* and *Clytæmnestra*; she assisted in the murder of her own mother to avenge the death of her father.

In a very large number of cases it can be demonstrated by psycho-analysis that such complexes play an important part. We expect to discover it especially in patients who, in spite of normal heterosexuality, and in spite of encountering many opportunities of and even calls to marriage, have reached middle age without having engaged in matrimony. This is especially to be found in only children, whose fixation of libido upon their parents is exceptionally difficult of transference elsewhere, and whose parents tend to foster the delusion that there does not exist in the wide world a suitable mate for their darling child.

The conclusion at which we have arrived from all these considerations is that our unconscious mind is on a lower, less mental, more neural, and more animal plane than our conscious mind, and it is pervaded with sexual thoughts and desires. Indeed, I believe

that I am not misrepresenting Freud when I say that he thinks that the unconscious mind is almost all sexual; but then it must be recognised that he uses the word "sexual" in a very wide sense. Attraction and friendliness, for example, are included under this term by Freud. Nevertheless, psycho-analysis has revealed that, "if our repressed mental material had free play, uncontrolled by consciousness, every one of us would probably remain a selfish, impulsive, aggressive, dirty, immodest, cruel, egocentric, and conceited animal, inconsiderate of the needs of others, and unmindful of the complicated social and ethical standards that go to make civilised society."* To the ordinary man, whose "herd instinct" has repressed such intolerable features of his character into the unconscious, and converted him into a moral, social, ethical, modest, and æsthetic being, it is incredible and absurd that his mental constitution and disposition are fundamentally so brutal. He is prepared to accept the fact that his anatomical and physiological characteristics are identical with those of the lower animals; but his mental characteristics—never! And so from time to time we find in the medical journals energetic objections to our new psychiatry, of course by people who have not studied it. These letters are interesting examples of what is technically known as the "resistance," which we shall study in our next lecture, and are unwilling arguments in support of Freudian doctrines.

In the *Medical Press and Circular* for 13th June 1894 is to be found a paper by the late Dr. Hughlings Jackson, entitled "The Factors of Insanities," and it will there be seen that that great man foresaw the fundamental principles of our new psychiatry. He pointed out that there is a positive and a negative element in every case of insanity, the negative being defect of consciousness or loss of *some* consciousness, the positive being activity of the consciousness remaining (on a lower level). For example, when a patient believes himself to be the Emperor of Europe, Hughlings Jackson points out that the chief defect (negative element) of consciousness is that he does not know that he is a clerk in the city, and the notion that he is the Emperor of Europe is due to the positive activity of a lower level of mentation. This is exactly what has been proved by our modern school of psychiatry. So far as consciousness is concerned, we know that it always loses something of its content, a complex which is repressed into the unconscious, while the notion that he is the Emperor of Europe is due to the distorted activities of the unconscious (a lower level of

* Ernest Jones, British Medical Association Annual Meeting, 1914.

mentation). While, therefore, we study and admire the insight and patient labour of the great Austrian psychologist, Professor Freud of Vienna, let us at the same time pay homage to the great English father of neurology, who taught us to understand the nervous system, Dr. Hughlings Jackson.

(*To be continued.*)

CLINICAL STUDIES. II.—ON THE ASSOCIATION OF PERNICIOUS ANÆMIA WITH SUBACUTE COMBINED DEGENERATION OF THE SPINAL CORD.

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THE object of this paper is to suggest that the anæmia associated with subacute combined degeneration of the spinal cord is much more frequently the pernicious form of anæmia than is usually supposed.

Subacute combined degeneration of the spinal cord is, in my experience, a rare condition. I have notes of five cases; in all of them the anæmia was, I believe, pernicious anæmia. (I have probably seen other cases which I did not recognise.) In two of the cases the diagnosis was confirmed by post-mortem examination; in both, appearances typical and characteristic of pernicious anæmia were present in the liver, bone-marrow, and other organs.

In his admirable article on "Subacute Combined Degeneration of the Spinal Cord" in Allbutt and Rolleston's *System of Medicine* (p. 791), Dr. James Collier makes the following statement with regard to the condition of the blood in cases of subacute combined degeneration:—"In a few instances anæmia has been absent throughout, the hæmoglobin and the cytology being normal; this occurs in cases which have run an acute and fatal course in a few months. Usually the blood shows a secondary anæmia of varying severity; the hæmoglobin ranges from 35 to 75 per cent., the lower of these figures being common; the colour-index is usually above the normal, and may be as high as 1.6. Anisocytosis, poikilocytosis, and polychromatophilia are common. Normoblasts are sometimes numerous, but megaloblasts have not been found. The leucocyte count is normal, unless some suppurative complication supervenes. The reaction for free iron in the liver has not been obtained in any case."

The impression made on my mind by this statement is that

the anaemia associated with subacute combined degeneration of the spinal cord is not usually, in Dr. James Collier's opinion, pernicious anaemia. It is certainly remarkable that in no case of subacute combined degeneration with which he was acquainted, when his article was written, was the reaction for free iron in the liver, which is such a characteristic pathological feature of pernicious anaemia, found on post-mortem examination. There can, I think, be no doubt that in many of the recorded cases of subacute combined degeneration of the spinal cord the anaemia was pernicious anaemia. The findings—both clinical and post-mortem—of many of the published cases seem to me to be quite conclusive on this point. This opinion appears to me to be corroborated by Dr. Collier's statement—"that the colour-index is usually above the normal, and may be as high as 1.6." This statement is very suggestive that the anaemia was in reality pernicious anaemia. A high colour-index, in my experience, though not *per se* conclusive, is very strongly suggestive of pernicious anaemia. A high colour-index is seen in some cases of leukaemia, more especially the lymphatic form, but, so far as I know, and as my experience enables me to judge, is not met with in secondary anaemia or in cases in which the anaemia is apparently idiopathic (for which there is no discoverable cause) unless the anaemia is of the pernicious type.

The age-period at which subacute combined degeneration is most frequent seems to be corroborative of this view. Dr. Collier states as regards the age of patients affected with subacute combined degeneration of the spinal cord (p. 787):—"The extremes at which the onset of the disease has been recorded are thirty-five and sixty-five years of age. A few cases have occurred between thirty and forty, but during the succeeding decade they become increasingly numerous, and the highest incidence is reached between the ages of fifty-five and sixty years."

Now, profound and persistent anaemia in patients, especially in male patients, over forty years of age, which is actually and really "*idiopathic*" (*i.e.* for which there is no discernible cause, such as malignant disease, especially malignant disease of the body of the stomach; hæmorrhage from piles; insidious bleeding from a duodenal or gastric ulcer; Bright's disease, etc.), is usually, in my experience, pernicious anaemia.

The age-period at which pernicious anaemia and subacute combined degeneration of the spinal cord occur is practically the same. In 140 cases of pernicious anaemia of which I have notes,

107 cases (or 76·4 per cent.) were between the ages of 35 and 65 (inclusive) when the patients came under observation; that is to say, at the same age-period at which subacute combined degeneration of the spinal cord most frequently occurs (see Fig. 6, p. 271).

Further, I am disposed to think that in many cases of subacute combined degeneration of the spinal cord in which the anæmia does not at first conform to the pernicious type, the anæmia is probably in reality pernicious anæmia. Case III. is very important and instructive in this respect. The patient, a man of 31, suffered from nervous symptoms suggestive of disseminated sclerosis; in the earlier stages of this case there was slight anæmia, but no blood examination was made. A fortnight before his death (11th November 1907) a blood-count showed no features suggestive of pernicious anæmia; the condition of the blood at that date was as follows: red corpuscles 4,200,000 per c.mm., hæmoglobin 70 per cent., colour-index 0·8. During the next fortnight very rapid deterioration of the blood took place without loss of blood or other obvious cause (evidently the result of an acute intoxication), and the stage of rigidity passed into the stage of flaccidity. On 25th November the condition of the blood was: red corpuscles 600,000 per c.mm., hæmoglobin 28 per cent., colour-index 2·3. Some normoblasts and megaloblasts were present in the blood, which presented all the characteristic features of pernicious anæmia. On 27th November the patient died. Post-mortem examination showed (1) all the characteristic appearances of pernicious anæmia—the liver gave a very marked Prussian-blue reaction, the marrow of the bones was typical; and (2) the typical appearances in the spinal cord of subacute combined degeneration.

In this case, then, there was for *three years* no marked anæmia while nervous symptoms due to subacute combined sclerosis of the spinal cord were present; then all of a sudden, apparently as the result of acute intoxication, rapid destruction of the blood took place, and the characteristic clinical features (confirmed by post-mortem examination) of pernicious anæmia developed.

Now, this case seems to suggest that in cases of subacute combined degeneration associated with anæmia, which is thought to be secondary in nature, but in which the colour-index is above the normal (such cases as Dr. Collier mentions), the anæmia is in reality pernicious anæmia. The same statement perhaps applies to some of the cases of subacute combined

degeneration in which the anæmia is thought to be secondary and in which the colour-index is normal or below the normal.

I submit that the cases recorded below and the arguments which I have just advanced suggest that the anæmia associated with subacute combined degeneration of the spinal cord is much more frequently pernicious anæmia than is usually supposed—indeed I almost feel inclined to suggest, looking at the course which Case III. pursued, that if the condition were to last long enough, the anæmia associated with subacute combined degeneration of the spinal cord would in many, possibly in all, cases prove to be pernicious anæmia. Or, to put it another way, when the nervous symptoms indicate the presence of subacute combined degeneration of the spinal cord, the physician should strongly suspect that the anæmia associated with the condition is pernicious anæmia, for, even if the blood condition is not at first indicative of pernicious anæmia, the characteristic features of pernicious anæmia will, if the patient lives long enough, be developed in some (possibly in all) cases.

It will be noted that in this case, and also in Case V., the development of the flaccid stage of subacute combined degeneration and the acute blood destruction were coincident. This fact has also been noted by Collier; he states (*ibid.*, p. 794):—"The change from the spastic to the flaccid type sometimes coincides with the appearance of severe anæmia." The coincident occurrence of rapid blood destruction and the development of the flaccid paralysis is suggestive that both are due to acute intoxication. It will be interesting to observe whether in other cases of subacute combined degeneration rapid deterioration of the blood, deeply pigmented urine, and fever accompany or immediately precede the development of the flaccid stage of the disease.

We are ignorant of the exact cause of pernicious anæmia. The facts at our disposal seem to suggest that it is probably a toxin, perhaps absorbed, as Dr. William Hunter has suggested, from the gastro-intestinal tract (though I differ from him in thinking that oral sepsis, due to bad teeth, is the cause, or a cause, of the disease; the glossitis and inflammatory spots on the buccal mucous membranes, which are so frequent in pernicious anæmia, are, I think, part and parcel, a feature of the disease, not a cause). But if this is so, we do not know whether the clinical condition which we term pernicious anæmia is always due to one and the same toxin, or whether it may not be due to more than one, possibly several, different toxins.

Dr. Collier argues that in cases of subacute combined degeneration the anæmia is not the cause of the spinal lesion, but that the anæmia and the spinal lesion are due to a common cause, probably a toxin or perhaps several different toxins. I agree with this view; it seems to me to be much more probable than Nonne's view, which suggests that the cord lesion is due to vascular changes, the result of the anæmia.

In some cases of subacute combined degeneration the anæmia precedes, in others occurs coincidently with, and in others follows the spinal symptoms; in other words, the development and severity of the spinal symptoms do not depend upon the development and severity of the anæmia.

It seems reasonable to suppose, and clinical and pathological facts seem to support this view, that—

1. In some cases the toxin acts entirely on the blood, the result being pernicious anæmia without spinal symptoms. In this group are included the great majority of cases. Of 140 cases of pernicious anæmia of which I have kept detailed notes, there were only four cases of subacute combined degeneration. (Case II. recorded in this paper was not included in my cases of pernicious anæmia.)

2. In some cases the toxin acts entirely or chiefly upon the spinal cord; in these cases there is subacute combined degeneration without anæmia or with slight anæmia. These cases are rare.

In some of the cases included in this group in which the anæmia was at first slight, and in which the blood changes in the early stages were not suggestive of pernicious anæmia, profound pernicious anæmia is ultimately developed. Case III. is an illustration of this group.

3. In some cases the anæmia precedes the development of spinal symptoms. Cases IV. and V. are examples of this group. This seems to be the most frequent type of subacute combined degeneration.

4. In some cases the toxin from the first, or at all events at the time when the patient first comes under observation, acts both on the blood and the spinal cord, the result being typical pernicious anæmia with subacute combined degeneration of the spinal cord. Case I. seems to be an example of this group.

The notes of the cases are as follows:—

CASE I.—Male, aged 72, seen in consultation on 28th August 1896, suffering from profound pernicious anæmia and spinal symptoms. The

condition (anæmia and spinal symptoms) had developed several months previously without apparent cause. The patient complained of numbness and loss of power in the legs; the knee-jerks were absent; there was considerable muscular atrophy and anæsthesia both in the legs and thighs. This stage of flaccid paralysis had been preceded by a condition of rigidity with increase of knee-jerks. At first the bladder and rectum were not affected.

Subsequent Progress of the Case.—Under gradually increasing doses of arsenic (maximum dose reached nine minims daily), strychnine, massage, and the faradic current, there was slight temporary improvement as regards the anæmia; no improvement in the spinal symptoms. Ultimately the bladder and rectum became involved, and the patient died three months later.

No post-mortem examination.

CASE II.—Male, aged 72, seen in consultation on 18th May 1898. Duration, four years.

Symptoms.—Profound anæmia with spinal symptoms; numbness and anæsthesia in legs and arms; flaccid paralysis; loss of reflexes; incontinence of the bladder and rectum. In the earlier stages of this case shooting pains in the legs, loss of the deep reflexes, and an ataxic gait were the chief symptoms, and the case had been diagnosed by a distinguished London neurologist as tabes. It was, in its early stages, an example of the "tabetic" form of subacute combined paralysis. This form, though rare, is a well-recognised type of the disease; tabetic in its early stages, it passes like the ataxic-spastic or spastic type into the flaccid stage of paralysis, usually in association with profound anæmia, in the later stages.

The patient died a year later. There was no post-mortem examination.

Note.—I have not included this case in my cases of pernicious anæmia as no examination of the blood was made. I am, however, disposed to think it was a case of pernicious anæmia. With this opinion Dr. Aldren Turner, who joined in the consultation, agrees.

CASE III.—Male, aged 33, admitted to Edinburgh Royal Infirmary on 18th September 1906 suffering from ataxic-spastic paraplegia, vertical nystagmus, derangements of the bladder and rectum, and optic atrophy exactly resembling that characteristic of disseminated sclerosis.* The mucous membranes were slightly anæmic. No examination of the blood was made at this date. The condition seemed to be indicative of disseminated sclerosis.

* On 25th February 1907 Dr. W. G. Sym's report on the eye condition was:—"Vision is $\frac{6}{18}$ in the right eye and $\frac{6}{24}$ in the left. The optic discs are definitely paler than normal, especially at the outer side. The vessels are slightly reduced in size."

The illness had commenced at the age of 31 ; the patient had been previously healthy, and had not suffered from syphilis.

Under treatment (5 minims of Fowler's solution, thrice daily, with rest in bed and massage) rapid improvement took place ; the patient's walking quickly improved, and the bladder derangement disappeared. He was discharged from hospital on 3rd November 1906 walking well, and stating that he felt fit for work.

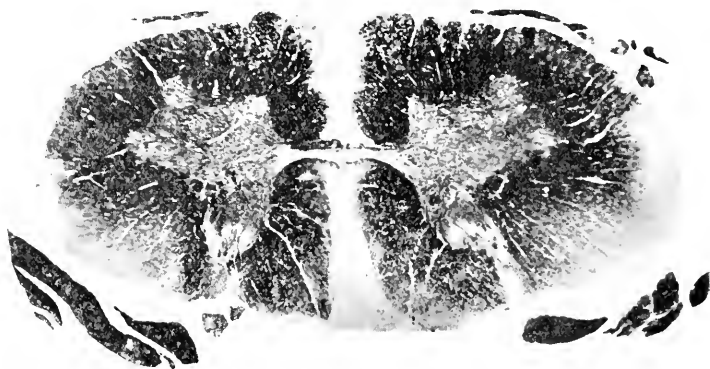


FIG. 1.—Section through the cervical enlargement of the spinal cord in the case of subacute combined degeneration described in the text. (Stained by Weigert-Pal.)



FIG. 2.—Section through the mid-dorsal region of the spinal cord in the case of subacute combined degeneration described in the text. (Stained by Weigert-Pal.)

On 20th February 1907 he was readmitted to the Infirmary. The ataxic-spastic paraplegia was very marked, and he could only walk with support. The urinary difficulties had returned—he had to “force” in order to get the water away. He complained of an aching pain in the left side of the back, of numbness, prickling, and coldness in the legs, and of a sensation as if he were walking on rubber.

He was again treated with arsenic and again improved. On 8th May 1907 he was discharged, able to walk well with the help of one stick, and saying that he was fit for work.

For three months after his discharge he continued well, and was able to follow his occupation. Then the weakness in the legs and difficulty in walking again recurred, and he began to suffer from pain in the back.



FIG. 3.—Section through the lower dorsal region of the spinal cord in the case of subacute combined degeneration described in the text. (Stained by Weigert-Pal.)

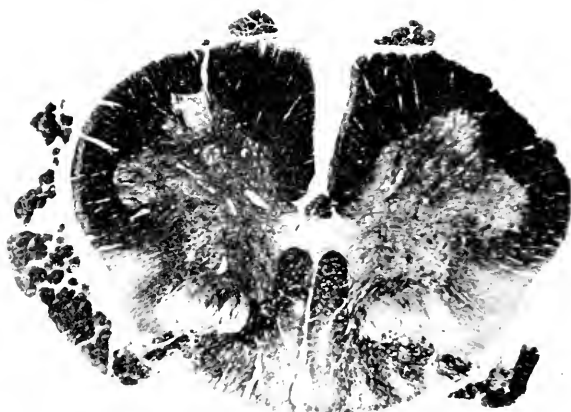


FIG. 4.—Section through the lumbar enlargement of the spinal cord in the case of subacute combined degeneration described in the text. (Stained by Weigert-Pal.)

The periods of marked improvement and relapses which occurred seemed to corroborate the diagnosis of disseminated sclerosis.

On 15th October 1907 the patient was admitted to the Infirmary a third time, complaining of severe pain in the lower part of the back and in the legs, numbness and tingling in the feet, and a cold feeling in the knees and elbows. The knee-jerks and Achilles-jerks were still

markedly exaggerated, ankle-clonus, and an extensor response were present on both sides; there was considerable difficulty in making water; the bowels were obstinately constipated.

On 11th November a blood-count showed the red blood corpuscles numbered 4,200,000 per c.mm., the hæmoglobin was 70 per cent., and the colour-index was 0·8. After this date very rapid deterioration in the blood occurred. On 25th November the red blood corpuscles numbered 600,000 per c.mm., the hæmoglobin was 28 per cent., and the colour-index 2·3. During the last stage of the case the microscopical characters of the blood were quite typical of pernicious anæmia; some megaloblasts and normoblasts were present.

After 11th November the legs became completely paralysed, the muscles soft and atrophied; the knee-jerks and Achilles-jerks disappeared; the Babinski sign remained. The legs, lower part of the trunk, and abdomen became anæsthetic; incontinence of the bladder and rectum developed. In short, the spastic condition, with exaggerated knee-jerks, passed into the flaccid stage, with loss of knee-jerks, paralysis of the bladder and rectum, and muscular atrophy.

The patient died on 27th November.

The blood-count at different dates was as follows:—

	Red Corpuscles.	Hæmoglobin percentage.	Colour-Index.
November 11, 1907.	4,200,000	70	0·8
" 19, "	1,500,000	28	0·9
" 21, "	1,190,000	25	1·0
" 23, "	980,000	25	1·3
" 25, "	600,000	28	2·3

Post-mortem examination showed all the appearances characteristic of pernicious anæmia, free iron reaction in the liver, typical alteration in the bone marrow, etc., and the spinal lesions characteristic of subacute combined degeneration (see Figs. 1, 2, 3, and 4).*

CASE IV.—Male, aged 34, single, bank clerk, admitted to Edinburgh Royal Infirmary on 29th October 1910 suffering from pernicious anæmia and spinal symptoms. Duration of the anæmia three years; of the spinal symptoms, seven months. The only apparent cause was loss of blood from piles. For the last six months has suffered from stiffness and weakness in the legs, and some pain in the small of the back, which has been worse during the past three weeks.

The patient was a well-built, muscular man, 5 ft. 8½ ins. in height, 11 st. 3 lbs. in weight. The red blood corpuscles numbered 2,350,000

* Case fully recorded in *British Medical Journal*, 11th June 1910, p. 1396.

per c.mm., the hæmoglobin was 70 per cent., and the colour-index 1.5; the microscopic characters of the blood were typical of pernicious anæmia. The conjunctivæ had a yellow tinge. The gait was spastic and ataxic. The patient complained of a dull aching pain in the small of the back, tightness as if a string were tied round the waist, and a numb feeling in legs and buttocks.

The knee-jerks and Achilles-jerks were exaggerated; there was double ankle-clonus; on the right side an extensor response, no toe movement on the left.

During the next fortnight the weakness in the legs markedly increased, slight nystagmus on looking to the right and left developed, incontinence of the bladder and rectum occurred. The blood condition showed little change.

On 11th November 1910 the red blood corpuscles numbered 2,180,000 per c.mm., the hæmoglobin was 64 per cent., and the colour-index 1.5; the microscopic characters of the blood were typical of pernicious anæmia.

The patient went home on 22nd November 1910. The paralysis rapidly passed into the flaccid condition, with muscular atrophy, loss of all reflexes except the knee-jerks, paralysis of the bladder and rectum, and bedsores. He died on 10th December 1910.

No post-mortem examination.

Treatment.—Arsenic, maximum dose six minims, thrice daily.

CASE V.—Male, aged 42, married, admitted to Chalmers Hospital, Edinburgh, on 16th December 1912, suffering from pernicious anæmia and subacute combined sclerosis.

Duration, 3½ years. He had been under the care of various physicians, and had been treated with arsenic by the mouth. The anæmia had been present for some time before the spinal symptoms developed.

On admission, the red blood corpuscles numbered 2,275,000 per c.mm., the hæmoglobin was 80 per cent., and the colour-index 1.46. The legs were rigid, the knee-jerks and Achilles-jerks were exaggerated, ankle-clonus and an extensor response were present on both sides.

The patient complained of numbness in the legs, and localised areas of anæsthesia and analgesia were present. There was occasionally incontinence of urine and feces.

The patient did not improve under treatment (arsenic by the mouth, two injections of neo-salvarsan, massage, etc.).

On 10th March 1913 the red blood corpuscles numbered 1,530,000 per c.mm., the hæmoglobin was 35 per cent., and the colour-index 1.1. The spastic condition of the lower extremities disappeared, and a flaccid state with loss of reflexes developed.

The patient died on 22nd March 1912. For six days before death the temperature was above the normal; on the day of his death it reached 104.4°.

Post-mortem examination showed the characteristic appearances of pernicious anæmia (free iron reaction in the liver, typical alteration in the bone marrow, etc.) and subacute combined degeneration of the spinal cord.

THE DIFFERENTIAL DIAGNOSIS OF SUBACUTE COMBINED PARALYSIS AND DISSEMINATED SCLEROSIS.

It is only in very rare cases, such as the *third case* described above, that there is likely to be any difficulty on this point.

In that case spastic-ataxic paraplegia, with nystagmus, optic atrophy, and derangement of the bladder and rectum, were present in the earlier stages. The disease developed at the age of 31, and was characterised by marked periods of improvement and remission. These facts were strongly suggestive of disseminated sclerosis. It was only when profound anæmia, characteristic of pernicious anæmia, and the flaccid stage of paralysis developed that any doubt arose as to the case being one of disseminated sclerosis. This case teaches that in all cases of suspected disseminated sclerosis in which the patient is in any degree anæmic, careful examination of the blood should be made.

In both subacute combined sclerosis and the spinal form of disseminated sclerosis ataxic-spastic or spastic paraplegia, with exaggeration of the deep reflexes and subjective sensory disturbances, are usually the most prominent spinal symptoms.

The points of difference between the two conditions are as follows:—

Age.—The age-period at which the two diseases develop is very different. Disseminated sclerosis comparatively rarely develops after the age of 35, and subacute combined paralysis very rarely develops before the age of 35.

The age-period at which the disease commenced in 110 cases of disseminated sclerosis and the age-period when the patients came under observation in 140 cases of pernicious anæmia (the age-period at which pernicious anæmia and subacute combined paralysis develop is practically the same) is graphically represented in Figs. 5 and 6.

Sex.—In my experience, disseminated sclerosis is decidedly more frequent in females, while subacute combined paralysis (and

pernicious anemia) is more common in males. The opinion of other observers, however, differs on this point. My figures are as follows:—In 110 cases of disseminated sclerosis which I

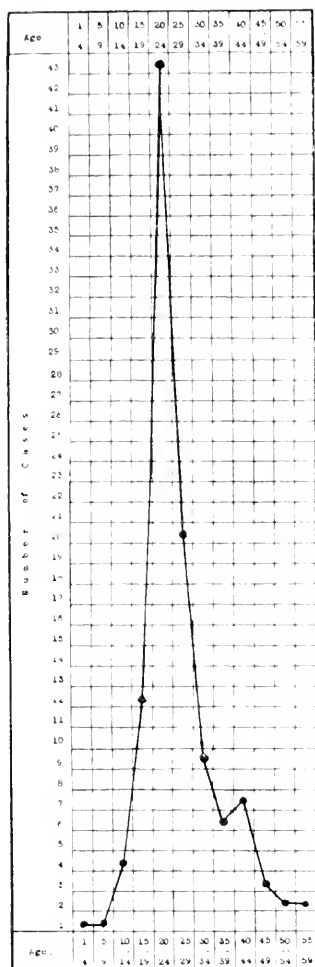


FIG. 5.—Age-period of development in 110 cases of disseminated sclerosis, in periods of five years.

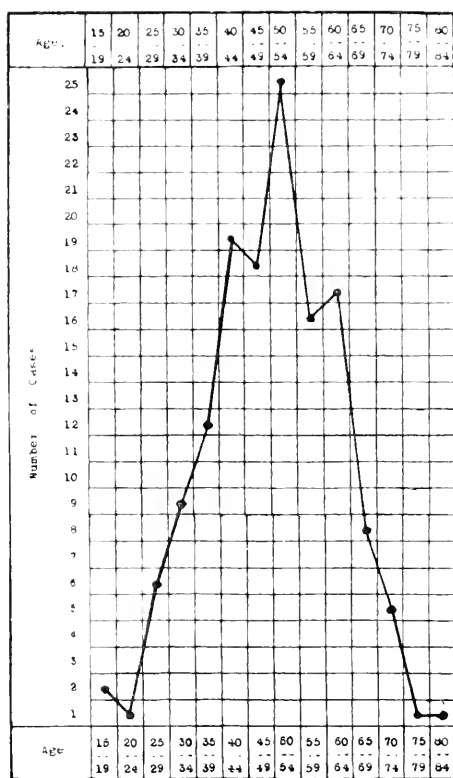


FIG. 6.—Age-period when the patient first came under observation in 140 cases of pernicious anemia, in periods of five years.

analysed some years ago (*Clinical Studies*, vol. ii. p. 201) 67, or 61 per cent., were females, and 43, or 39 per cent., were males. All of my 5 cases of subacute combined degeneration were males. In my 140 cases of pernicious anemia 91, or 65 per cent., were males, and 49, or 35 per cent., were females. It is probable,

I think, that if a sufficient number of cases of subacute combined sclerosis were analysed, the male cases would be found to be more frequent than the female cases.

Course and Duration.—Disseminated sclerosis is usually a very chronic disease, and in the majority of cases is marked by periods of improvement and relapse. Subacute combined paralysis rarely lasts more than six years; its duration is usually considerably less than this; periods of remission and improvement very rarely occur except in the earlier stages of a few cases. (Case III. is quite exceptional in this respect.)

Association with Anæmia.—Disseminated sclerosis is not associated with anæmia, except as an accidental occurrence (chlorosis is occasionally accidentally associated with disseminated sclerosis); whereas, in the great majority of cases of subacute combined sclerosis, profound anæmia (usually, I think, pernicious anæmia) is developed at some period or other of the case, frequently in the early stages. The presence of profound anæmia (usually, I think, pernicious anæmia), with characteristic spinal symptoms, is of the greatest diagnostic significance.

Symptoms.—Ataxic-spastic or spastic paraplegia, with exaggeration of the deep reflexes, and the Babinski sign are common features in both diseases; but the passage of an ataxic-spastic or a spastic paraplegia into a flaccid paraplegia, with muscular atrophy and loss of the deep reflexes, does not occur in disseminated sclerosis (except, perhaps, in very rare cases), while it is highly characteristic—in fact one of the most striking features—of subacute combined sclerosis.

Sensory subjective symptoms occur in both conditions, but are usually more marked in subacute combined sclerosis. Objective derangements of sensation are rare in disseminated sclerosis, but common in subacute combined sclerosis; in subacute combined sclerosis the sensory symptoms, both subjective and objective, usually present the stocking-glove distribution in the early stages, and an ascending segmental distribution as the disease advances.

In disseminated sclerosis, pain in the lower part of the back is a frequent symptom, but is usually, in my experience, less prominent and severe than in subacute combined sclerosis.

In disseminated sclerosis, derangements, usually slight, of the bladder and rectum are common in the early stages of the disease. In subacute combined sclerosis, profound derangements of the bladder and rectum are usually present in the later stages of the

disease, but seem to be less frequent than in disseminated sclerosis during the early stages.

In disseminated sclerosis, nystagmus, volitional tremor, speech affections, and optic atrophy are frequent and characteristic symptoms; they do not occur, or very rarely occur, in subacute combined sclerosis. (Case III, in which there was nystagmus and optic atrophy, is quite exceptional in this respect; in that case the nystagmus was peculiar in character—vertical in its direction; in disseminated sclerosis the nystagmus, in my experience, is horizontal.)

Dr. James Collier, whom I consulted in the year 1910 with regard to the occurrence of optic atrophy and relapses, remissions and periods of improvement in cases of subacute combined degeneration, kindly wrote me as follows:—

“I have just written the article on subacute combined degeneration for Allbutt's *System*, and I have been carefully into all the cases we have had at Queen Square, and also into all the cases that I have found in the literature. I make the following statement upon optic atrophy:— ‘Optic atrophy has been reported in a good many cases, but it is possible that the pallor of the disc, which is striking in some of the anæmic cases, has been confused with optic atrophy, for I have never myself seen undoubted atrophy of the disc. Dimness of vision is common when anæmia and debility are severe.’ In several of our cases at Queen Square the note that optic atrophy was present had been made by the house-physician, but in no case was this opinion upheld by Mr. Marcus Gunn and Mr. Paton, who subsequently saw these patients. We have not as yet found any lesions higher than the encephalon, and, from the anatomical point of view, one would not expect optic atrophy in this disease. Your second question is of great interest, and is one that I should have answered in the negative two years ago. But since then I have followed to autopsy (1) cases in which the onset was an apparently functional paraplegia which improved for a time; (2) cases in which there was a marked temporary improvement; and (3) one case in which the onset was so rapid as to suggest acute myelitis, and in which temporary attacks of paraplegia lasting a week or two had occurred eight months and four months before the onset respectively and had been completely recovered from. This last case was an unusually rapid one, but the pathological condition found by Dr. Holmes was typical. I have always pointed out that the diagnosis of this disease in the early stages from the ataxic paraplegic form of disseminated sclerosis was an important one, but we have not had a case in which this differential diagnosis has been difficult. From our knowledge of the disease and its anatomy it seems to me easy to conceive cases of slow onset in which the clinical picture might be

exactly that of typical disseminated sclerosis, for many cases present no anæmia till late."

With regard to the differential diagnosis of subacute combined degeneration of the spinal cord and disseminated sclerosis, Risien Russell, Batten, and Collier make the following statements:—

"The early clinical picture of combined degeneration, that of slight ataxy and spasticity, resembles closely that of the common paraplegic form of disseminated sclerosis in an early stage. . . . In attempting to distinguish these two diseases, careful attention should be paid to the history. The age at which combined degeneration occurs is not the most common for the appearance of symptoms of disseminated sclerosis. The preponderance of subjective sensations in the legs, the absence of the functional manifestations, of exacerbations and remissions of the symptoms, of nystagmus, and of sphincter trouble, which are so usual in disseminated sclerosis, and the presence of irregular pyrexia are probably of great importance in the early diagnosis of combined degeneration.

"The presence of anæmia in an early case of spastic paraplegia should give rise to a suspicion, but the possibility of chlorosis associated with disseminated sclerosis in young women must be borne in mind. A symmetrical affection of all limbs, with slight ataxy and spasticity, preponderating in the legs, is a most important distinguishing symptom of combined degeneration."*

Etiology.—It is interesting to note that in both disseminated sclerosis and subacute combined sclerosis the sclerotic lesions in the spinal cord are supposed by most authorities to be due to some irritant or toxin which is distributed through the nerve centres by the blood. But if this is so, it is obvious that the irritant or toxin is not the same in the two diseases.

The distribution of the lesions in the spinal cord is quite different in the two conditions.

In disseminated sclerosis the lesions are typically "indiscriminate" †—patches of sclerosis scattered here and there haphazard, as it were, over the transverse sections of the cord at any, usually

* *Brain*, 1900, vol. xxiii. p. 58.

† In the first edition of my book on the *Diseases of the Spinal Cord*, published in the year 1882, I suggested the term "indiscriminate" as opposed to "system" lesions. "*The affections of the cord which are primarily nervous are either acute or chronic. In some the diseased process is strictly limited to definite physiological tracts. These affections are called system diseases. In others the morbid process has no such physiological limitation, but involves at haphazard, as it were, a greater or smaller portion of the transverse section. To these lesions the term indiscriminate may be applied. In a third group of*

many levels, and in any, usually many, and indeed it may be almost every, segment; in most cases of disseminated sclerosis there is no ascending or descending secondary degeneration; in disseminated sclerosis the grey matter of the spinal cord is often involved; in disseminated sclerosis the brain and the peripheral and cranial nerves are often (usually) involved.

In disseminated sclerosis the toxin seems to have a selective action for the white matter of the nerve tubes as well as for the neuroglial tissue, for, as I figured in the first edition of my book on the *Spinal Cord*, published now thirty-three years ago, compound granule corpuscles and fatty globules are, in some cases, met with in large numbers, not only in the sclerotic patches, but in the lymphatic spaces and around the blood-vessels, while the axis-cylinders are characteristically spared.

Subacute combined degeneration does not appear to be a primary "system" disease of the spinal cord. The lesion seems to commence in the form of isolated patches of degeneration in the posterior, lateral, and anterior columns; the coalescence of these isolated patches, in which the axis-cylinders are destroyed, leads to the production of secondary ascending and descending degeneration, which at certain stages of the disease might lead one to suppose that the lesion was a "system" disease (primary degeneration) of the affected tracts.

It seems probable that in disseminated sclerosis some developmental or congenital defect of the neuroglial or nervous tissue (perhaps similar to or analogous to the gliomatosis in syringomyelia), which renders it more vulnerable or liable to be affected by irritation than the neuroglial or nervous tissue of the normal individual, is an important factor in the production of the disease. The comparatively early age at which disseminated sclerosis is developed, and the fact that it occasionally occurs in young children, seem in favour of this view.

In subacute combined sclerosis the lesion is greatest in extent cases, as we shall afterwards see, these two forms of lesions are combined" (p. 31).

"The *system lesions* of the spinal cord are either *primary* i.e. arising independently of any previous lesion or *secondary* i.e. resulting from some previous morbid condition. To the secondary system lesions the term '*secondary degeneration*' is usually applied" p. 32.

"The great characteristic of an 'indiscriminate' lesion is that it is not, *of necessity*, limited to any particular physiological tract, but may affect any part of the transverse section, though it occasionally, but rarely, happens that an indiscriminate lesion may be limited to a definite physiological tract" (p. 51).

in the mid-dorsal region, and involves more particularly the posterior columns, the crossed pyramidal tracts, the direct cerebellar tracts, and the direct pyramidal tracts; ascending and descending secondary degenerations are conspicuous features; the grey matter of the spinal cord is not involved; and the lesions very rarely indeed occur above the middle of the pons, and not, so far as I know, in the peripheral nerves.

The rapid passage of the ataxie-spastic or spastic stage of the disease, with increase of the deep reflexes, into the flaccid stage, with complete paraplegia, muscular atrophy, and abolition of the deep reflexes, has not, so far as I know, been satisfactorily explained by any post-mortem findings. No pathological changes in the anterior cornua, anterior nerve-roots, or motor peripheral nerves have, so far as I know, been found to explain the condition; perhaps there may be a lesion in the motor nerve-endings. So far as I know there are no observations on this point; it should be investigated.

ON AN OUTBREAK OF SEPTIC PHARYNGITIS.

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DURING the latter part of January and in February an outbreak of septic pharyngitis was prevalent in Edinburgh. A number of cases occurred among the domestic staff of the Royal Infirmary. They were admitted to a special ward, and came under my care, thus affording me an opportunity of studying the condition.

Up to the end of February I had seen 35 cases among the hospital maids alone, and this account is based on these cases.

Symptoms.—All the patients complained of a sore throat, and in most instances this was the only complaint. Headache was frequently admitted on direct inquiry. Earache, backache, and pains in the bones were present in a few instances.

The temperature was usually raised. It never exceeded and seldom reached 103° F. The common figure was 101° F. A few cases were afebrile.

The tongue was densely coated with fur in nearly all the cases.

In all the tonsils were greatly swollen. The uvula was swollen and often deviated to one side, generally the left. All the cases showed a membranous exudation. This seemed to begin as discrete, yellowish, translucent patches over the crypts. In the

later cases it had coalesced into a thick white membrane over nearly the whole tonsil. It never spread from the tonsil to the pharynx, but in one case the membrane was first seen in the form of whitish-yellow spots behind the tonsil, and in another case there was a large white patch on the posterior wall of the pharynx as well as on the tonsils when the case was first seen. The membrane was fairly easily removed. Sometimes the swab used in making applications to it became slightly blood-stained.

The membrane seemed to be an early and essential part of the clinical picture. Two cases of pharyngitis in which the membrane was absent were admitted to the ward for a few days. They both returned later with a membrane.

Cultures were made from the throat and a great variety of micro-organisms were found. The list comprised staphylococci; streptococci; pneumococci; Gram-positive and Gram-negative cocci; Gram-positive and Gram-negative bacilli; bacilli resembling the influenza bacillus in one case; diphtheroid bacilli in several cases; diphtheria bacilli in 5 cases; coliform bacilli, sarcinae, and yeasts.

Sickness occurred in two cases. There was sometimes a moderate leucocytosis. It never exceeded 12,000 per c.mm., and appeared to be proportionate to the patient's general health rather than to the amount of membrane or degree of fever.

Döhle's bodies were present in a small proportion of the polymorphs.

In a few cases the gland under the angle of the jaw was enlarged and tender.

The pulse was quickened in all cases.

The urine showed no abnormality beyond an unusually copious deposit of urates in a few cases.

Course.—The throat was treated at once, and the natural history of the illness may have been thereby modified.

The fever generally lasted for one day only. In a much smaller number of cases it lasted two days, and in a still smaller number, three days.

In 8 of the 35 cases a rash made its appearance on the third, fourth, or fifth day (1, third day; 4, fourth day; 3, fifth day).

It was always first seen on the flexor aspect of the elbows and in some cases was limited to this situation. In others it also appeared on the chest and front of the legs and thighs. It was never seen on the face. In most cases the rash was scarlatini-form, but rather more discrete, rather more papular, and more

dusky than in typical scarlatina. It faded entirely in 1, 2, or 3 days. In one case the rash had an entirely different character. It appeared on the fourth day on the arms and chest in the form of round, red, very slightly raised spots about the size of a threepenny piece. These rapidly enlarged and reached the size of florins, while some coalesced to form large areas of erythema. The spots faded at the centre, leaving a curious appearance of red rings.

This rash had practically all disappeared on the seventh day. In two of the cases with a scarlatiniform rash desquamation followed. Both had previously had scarlet fever. In four cases, without any previous rash, a profuse desquamation occurred on the forearms and face. In two of these it also appeared on the sides of the neck.

The desquamation began on the fifth, ninth, tenth, and eleventh day respectively.

The throat became clean in one or two days. The swelling lasted a day or two longer. The tongue also became clean in two days in most cases.

A few patients complained of weakness and shakiness for a day or two, but the great majority were back to work by the end of a week.

Complications.—In three cases there was a late development of cervical adenitis on the third or fourth day, which sometimes led to a return of fever. This passed off in a few days.

In three cases arthritis developed.

CASE I.—Sore throat complained of on 2nd February. Temperature, 101° F.; pulse, 128. Temperature normal next day. Discharged on 6th February. On 23rd February complained of pain and stiffness in the back and hips. Temperature rose in evening to 101·5°, remained about 100° till the 28th, then fell to normal. Pains subsided, and patient was sent to the Convalescent Home on 4th March. She had become markedly anæmic.

CASE II.—Sore throat began on 15th February. Temperature, 99°. Only ill three days. On 3rd March patient complained of pain in both ankles, which were considerably swollen. There was pain in the back, and the elbows were also stiff and tender. The tenderness was not limited to the joints, but was also present in the muscles and along the line of the tendons. Temperature, 99°. On 8th March pain was complained of in the right shoulder. There was no swelling, but the deltoid and triceps were tender.

CASE III.—Sore throat on 1st February. Back to work in six days. On 27th February complained of swelling and great tenderness in the ankles, knees, and right elbow. There was also very great tenderness in the calf muscles and in the muscles of the right upper arm. Temperature ranged from 103° to 104°, and in spite of large doses of salicin, remained above 102° for over a week. Gradual improvement then began.

It is a little difficult to say that these cases are not mere instances of ordinary rheumatism, and in Case III. the matter is complicated by the fact that the girl had previously suffered from rheumatic fever.

The cases under review, however, do not accurately reflect the frequency of this arthritic condition. It was reported to me, and, indeed, I could see for myself, that many of the throat cases had developed stiffness and lameness although they had not reported themselves ill.* It may be of interest to mention that seven members of a household of nine, seen in private practice, developed sore throats similar to those described, and that four of these developed arthritis and fever about a fortnight after the subsidence of the initial rise of temperature. In some cases the pain was present in the neck and fingers as well as in the larger joints.

In another household three of the inmates developed a similar arthritis with no history of throat affection, and two hospital maids who escaped pharyngitis are at present under treatment for painful joints and muscles.

Although it is a matter difficult to be sure of, I am strongly of opinion that none of these cases have yielded to salicylates as ordinary rheumatism would have done.

Treatment.—As soon as the cases were seen a swab was taken from the throat, which was then painted freely and somewhat forcibly with 1 per cent. formaline in water. The painting was carried out thrice daily.

The earlier cases were also treated with salicin in x.-gr. doses thrice daily. The later cases received no salicin and seemed to mend quite as well without it. The cases with persistently furred tongues received a sodium bicarbonate mixture, and such cases as seemed to require a tonic got a mixture containing *nux vomica*. Concomitant conditions, such as anaemia, etc., were attended to.

The arthritis cases were treated liberally with salicylates, but

* Three more patients have reported themselves since this was written.

I am not convinced that the pain was materially lessened or the fever shortened by their use.

THE NATURE OF THE ILLNESS.

Certain queries arise—

Was the Condition Influenza?—This question is complicated by the fact that influenza was rampant in Edinburgh at the time, but I have little hesitation in answering in the negative for the following reasons:—

1. No catarrhal symptoms were ever present.
2. Pains, apart from slight headache and backache, were seldom complained of.
3. The characteristic odour of influenza was absent.
4. The bacillus (or an organism resembling the influenza bacillus) was only found in one case.

Was the Condition Diphtheria?—The bacteriological report negatived this view in the great majority of cases, even admitting that the bacillus may have escaped notice in a certain proportion.

In regard to the five cases in which the bacillus was found, I offer the following considerations:—

1. The distinction between diphtheroids and true diphtheria bacilli is difficult, and depends on somewhat arbitrary standards. I do not attach much importance to this, however, and think that an organism reported by a competent bacteriologist to be a diphtheria bacillus should be so regarded.

2. It is admitted that true diphtheria bacilli may exist in healthy throats.

3. The cases in which diphtheria bacilli were found were no more serious, and in some cases were even less serious, than the typical case of the outbreak.

4. Two of the cases had suffered from diphtheria previously.

5. All the cases recovered as quickly and as completely as the others without specific treatment.

For these reasons I regarded the presence of diphtheria bacilli in the throats of these five cases as accidental rather than as a cause of illness, and looked upon the cases as diphtheria carriers.

The question now arose as to one's duty in the interests of the public health.

The matter seemed simple.

1. The cases were isolated, in a ward devoted to patients suffering from an ailment in every respect similar, except in the matter of the presence of diphtheria bacilli.

2. The throats were clean and the cases were no longer

carriers by the time the bacteriological report reached me. This is evidenced by the fact that a second swab was taken as soon as the report arrived, and in no second (or subsequent) swab were diphtheria bacilli found. I venture to suppose that they had not survived treatment.

On these grounds I believe that I have been justified in refraining from a diagnosis of diphtheria, and in retaining the patients in the ward.

Was the Condition Scarlatina?—This is negatived by the following facts:—

1. Some of the cases had previously had scarlet fever.
2. A rash was absent in most of the cases.
3. When present, the rash occurred late—never before the third day. It was never quite typical and sometimes unlike that of scarlatina.
4. The tongue never presented a “strawberry” appearance.
5. Leucocytosis was slight and Döhle’s bodies were scanty.
6. Although the throats had not the “angry” look of scarlet fever they were all severely inflamed. They would all have been formidable in scarlet fever, yet the general symptoms were but slight.
7. Of the 8 cases with a rash only 2 desquamated.

The four cases which desquamated without a previous visible rash do not throw any light on the question.

8. The arthritis was not typical of scarlatina, and was a much later occurrence than the usual arthritis of scarlet fever.

Judging from the cases which have come under my cognisance, I conclude:—

1. That this outbreak is neither influenza, diphtheria, nor scarlatina.
2. That it is due to an infection of the tonsils and pharynx.
3. That owing to the great similarity of symptoms and course the infection is a specific one.
4. Owing to the multiplicity of organisms found, the isolation of the specific germ may be very difficult.

I understand that Dr. Logan, the clinical pathologist to the Infirmary, to whom I am indebted for painstaking examination of the swabs, has isolated a new Gram-negative diplococcus from a very large proportion of my own and other cases, but that he is not yet in a position to make a pronouncement on the subject.

5. Lastly, I regard the joint affection which develops about a fortnight after the initial illness as a septic or toxic arthritis due to absorption of toxins from the throat rather than a subsequent manifestation of ordinary rheumatism.

CLINICAL RECORD.

FRACTURE OF THE RADIUS AND RUPTURE OF THE
RADIAL ARTERY IN A CHAUFFEUR.

By R. CHARLES ALEXANDER.

W. B., æt. 21, chauffeur, was admitted to Ward 6, Royal Infirmary, on the evening of 9th January 1915, complaining of severe pain and swelling of the right forearm.

History.—On Sunday, 27th December, patient was cranking up his car when it “back-fired,” and the crank slipped from his hand and rapidly revolved, striking him on the front of the forearm, and inflicting a small wound on the radial side at the junction of the middle and lower thirds, from which there was such profuse bleeding that emergency tourniquets were applied above and below the wound. About an hour later he saw his panel doctor. There was now considerable swelling of the arm, but on removing the tourniquets the doctor found there was no bleeding from the wound, and thought that the condition was one of severe contusion with possible rupture of a small vein. He dressed the wound and put the arm in a sling. The bony points of the forearm were in their normal relation.

The patient was again seen by his doctor on the 29th and 31st December. Light massage was employed, and the patient was able to perform simple movements.

On 2nd January the patient had so far recovered that he was attempting to shave, when he felt severe pain in the arm, and the doctor, on examining the arm that day, discovered a fracture of the radius and put the arm in splints. The patient then left his employer's and went to reside at his father's house some miles away.

On Thursday, 7th January, the patient was suffering so much pain that he was unable to travel to see his panel doctor, who asked the local doctor to see him. The latter found the wound “looking septic” and the patient ill. He therefore probed the wound, and let out some blood-stained serum. The patient was relieved; but on Saturday, 9th, the pain was again severe, and, after consultation, both doctors decided that he should come to the Royal Infirmary, Edinburgh. He was admitted to Ward 6, and, at the request of the house-surgeon, I saw him the same evening.

Examination.—On admission he looked tired and ill. His temperature was 100° F. and his pulse 90. Locally there was a small wound about $\frac{3}{4}$ -inch in length over the radial aspect of the anterior surface of the right forearm at the junction of its middle and lower thirds. The wound was covered with dark, unhealthy-looking blood-clot, and around

it was a red, swollen area about three inches in diameter, which was tense and very tender to the touch. The remainder of the forearm was swollen and oedematous, pitting easily on pressure.

Treatment.—As the wound seemed to be of a punctured nature and possibly septic, I decided to explore it, and, under general anaesthesia, made an incision about three inches long in the line of the radial artery, the punctured wound occupying the centre of the incision. On dividing the skin a large amount of dark blood clot came out, and this was followed by free arterial bleeding, which, on examination, was found to come from a longitudinal wound of the radial artery about $\frac{1}{2}$ -inch in length. The artery was divided across and tied on either side of the rupture. During the manipulations a considerable amount of dark clot came away from the parts round the vessel, and I felt crepitus about the junction of the middle and lower thirds of the radius. I made no attempt to explore the fracture from the wound, as there was no deformity. Interrupted sutures of silkworm gut were inserted, the wound was dressed, and local splints were applied to the forearm.

On Monday, 11th, Dr. McKendrick screened the arm for me, and a slightly oblique fracture in excellent position was seen at the junction of middle and lower thirds of radius. The patient remained in hospital a week, and his wound was almost healed when he left. Owing to the wound in the forearm very little massage was attempted, but the voluntary movements at all joints were good. His doctor tells me that the fracture has united normally, and that he resumed work on 15th February. A little clear serum discharged from one end of the wound.

Comment.—There are two interesting features in this case. Firstly, the site of the fracture was rather higher in the bone than usually described in this variety of "chauffeur's fracture" by direct blow from the crank. The other variety, in which the break is caused by the hand being forcibly wrenched round while still holding the crank, closely resembles a Colles' fracture.

Secondly, the application of the emergency tourniquets, by causing clotting in the surface wound, practically converted an open wound of the artery into a subcutaneous rupture. From the position of the wound on the anterior surface of the artery, and from the fact that there was no displacement of the bony fragments, I consider that the artery was ruptured by the force of the blow on the arm, and that the injury to the vessel was not due to puncture by either fragment of the bone.

I desire to express my thanks to Mr. Dowden, in whose ward the patient was, for allowing me to treat and publish the case.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., J. D. COMRIE,
M.D., AND ALEX. GOODALL, M.D.

SYPHILITIC NEPHRITIS.

STENDEL and Austin (*Amer. Journ. Med. Sciences*, January 1915) point out that in recent years there has been accumulating evidence that many cases of nephritis, chronic as well as acute, are caused by the micro-organisms or the toxins of the infectious diseases. Thus scarlatina, diphtheria, tonsillitis, influenza, pneumonia, and streptococcal infections are reckoned among the causes of nephritis. The lesions of the kidney differ in the different infections, and also in cases due to the same infection. There is no distinctive morphological picture by which the antecedent infection in any given case can be identified. The recognition of the etiological relationship is therefore based on the sequence of kidney disease following a well-marked infection. Such a relationship is obviously more easily established in the case of acute infections than in a chronic one like syphilis. Moreover, as syphilis in certain situations and in certain forms presents a characteristic histological picture, it has been difficult to accept as syphilitic processes certain conditions in which these features are wanting. Thus, in the past, what is now recognised as syphilitic aortitis was not differentiated from other kinds of arterial disease.

The denial of syphilitic etiology where the expected morphological features of a syphilitic process are wanting may account for the relatively slight rôle accorded to syphilis in pulmonary pathology, and the same may also be applicable to diseases of the kidney. Unmistakable syphilitic lesions, such as gummata, are rare in the kidneys, but there are many cases of nephritis of various types in which the etiology is obscure, and in some of these it is not improbable that syphilis is the hidden causal factor. In the absence of histological evidence, and in view of the difficulty of tracing a nephritis back to such a chronic affection, the proof of the syphilitic nature of certain cases must be indirect. A few reports have been made of supposed spirochetes in the urine of cases of suspected renal syphilis, but the reliability of these reports may be questioned. Failing direct proof, statistical studies, exclusion of other causes, and similar evidence must be relied on.

A subacute, rapidly developing nephritis has been observed in several cases of early secondary syphilis where the kidneys had been previously healthy, and where no mercury had been given. Some such

cases of nephritis have improved under treatment by mercury, although some authors have been inclined to attribute nephritis in syphilitics to mercury rather than to syphilis. Nephritis in secondary syphilis begins acutely and usually in the first two or three months. Onset is insidious, albumin is abundant, and there may be uræmia and anuria. In the latter stages of syphilis, amyloid kidney and interstitial nephritis are the most frequent forms of renal disease, but gummata also occur, and there are numerous records of nephritis developing in late syphilis apparently cured or greatly improved by antisiphilitic treatment. An addition to our conception of syphilitic nephritis has been suggested by Munk, who noted the occasional presence of doubly refractile lipoids in the urine of individuals with severe nephritis of any etiology, but found them so abundant in cases in which there was ground for suspecting syphilis as to warrant the recognition of a relationship between syphilitic nephritis and the presence of doubly refracting lipoids in the urine. These lipoids under the common microscope resemble neutral fat globules, but when examined under polarised light show a dark, central cross separating four bright peripheral quadrants. These globules occur normally in the suprarenal cortex, the thymus, the luetin cells, the puerperal uterus, the mesentery, and the choroid plexus. They have been observed in a wide variety of pathological conditions, and the process of their origin is unsettled, but their appearance pathologically in a cell may be taken as evidence of a severe cellular degeneration which is not reversible and of much more serious significance than the common glycerine ester type of fatty degeneration. In view of these facts, Stengel and Austin have made a study of the clinical significance of the appearance of these double refractile lipoids in the urine and their possible relationship to syphilitic nephritis. The urine of 46 cases was examined with a polarising microscope. Of the 46 cases, 23 had abundance of albumin and casts in the urine. Of the 23, 6 had positive Wassermann, 3 had strong presumptive evidence of syphilis, but not Wassermann, 14 showed no evidence of syphilis. The 6 positive Wassermann cases all showed lipoids in the urine, while only 5 of the 14 non-syphilitic cases showed lipoids. It is considered that there is evidence to show that there exists a parenchymatous type of nephritis due to syphilis, characterised by an abundant albuminuria, with many hyaline, granular, and occasionally epithelial casts, with a tendency to produce œdema, a moderate reduction of pthalein output, and exhibiting an almost constant tendency to the presence of doubly refractile lipoid globules, varying in size from that of an erythrocyte to globules 3 or 4 times that diameter. They are sometimes seen floating free in the urine, but are not rarely a constituent of a compound granular cast or may be on an epithelial cast.

Similar lipoid globules may be found in severe acute or chronic

parenchymatous nephritis of other etiology, but in only a minority of cases.

In the authors' last 84 cases of nephritis there could be recognised in 66 instances such causes as infections, lead, alcohol, senility, etc. In 18 cases no such factors could be determined. Of these 18 cases, there existed in 8 either a positive Wassermann or an unquestionable history of syphilis, or both; in 6 more no Wassermann had been done; in 4 cases syphilis was excluded. It is significant that syphilis should have been present in so many of the otherwise unexplained cases of nephritis.

A CASE OF OESOPHAGITIS EXFOLIATIVA.

Streit (*Correspond.-Bl. f. Schweiz. Aerzte*, January 1915) reports the case of a woman, aged 40, who suffered from severe pain in the throat and gullet after swallowing a piece of hard crust. The pain increased, and in the evening she vomited a quantity of mucus and blood, as well as long pieces of skin-like material which stuck in the mouth and throat. There was repeated vomiting of blood and mucus and a constant sensation of spasm in the throat. From the history a diagnosis of either a foreign body in the oesophagus or of an oesophageal tumour which had been injured by a foreign body was made. A medium-sized oesophageal sound was passed without difficulty. On withdrawal it showed a considerable quantity of blood. Some days later an oesophagoscope was passed, but could not be inserted beyond a point 3 or 4 cm. above the cardia. In this situation there was a large, white, undifferentiated mass. The withdrawal of the instrument was followed by the expulsion of some blood and much mucus.

A few days later, however, a large-sized olivary bougie was easily passed into the stomach. There was a difficulty in diagnosing a tumour of the cardiac end, and the failure with the oesophagoscope was accredited to spasm. The nature of the white mass remained a mystery. A large piece of the skin-like material which had been vomited was now obtained, and microscopic examination revealed stratified squamous epithelium, without either fibrous tissue or muscle. The case was now clear as one of oesophagitis exfoliativa. The white mass seen by the oesophagoscope had, doubtless, consisted of pieces of shed epithelium. Patient's symptoms gradually abated, and in rather less than a month she had made a satisfactory recovery. Beyond the history of swallowing a hard bread crust no etiological facts could be discovered. In the literature published since 1897 Streit could find the record of only one similar case.

SARCINÆ OF THE STOMACH AND THEIR DIAGNOSTIC VALUE.

Graham Chambers (*Dominion Medical Monthly*, January 1915) states that as far as we know gastric sarcinæ are peculiar to the stomach.

They are sometimes found in the faeces, but never unless they are also present in the stomach, and it is probable that the primary growth of the germ never occurs in the intestine. The origin of the growth in the stomach has never been solved. Their size, shape, and other characters indicate that they have practically nothing in common with the pigment-forming sarcinae of the air. Morphologically there are two forms of sarcinae ventriculi, which are, however, probably different stages of development of the same organism. One, the large-celled variety, is characterised by the cells exhibiting a bale-shaped arrangement, and staining with iodine; the other appears as small cocci arranged in irregular groups and not staining with iodine. Both forms are always found together, though one may preponderate.

Sarcinae in gastric contents indicate, as a rule, a high degree of stagnation of food in the stomach. The presence of sarcinae in cases characterised by normal or excessive acidity of the gastric juice is, in most cases, due to a benign disease.

The presence of sarcinae alone or sarcinae along with Boas-Oppler bacilli in cases of gastric disease of a few months' duration is frequently due to a malignant process. The finding of both sarcinae and Boas-Oppler bacilli in the gastric contents, whether free hydrochloric acid be present or absent, may be due to either cancer or peptic ulcer, but is more likely to be the result of the former than of the latter disease.

CROTALIN TREATMENT FOR EPILEPSY.

The treatment of epilepsy by hypodermic injections of rattle-snake venom was introduced by Spangler in 1909. In his latest communication on the subject (*Interstate Med. Journ.*, January 1915) he refers to his methods and states conclusions concerning results. Intramuscular injection is recommended. The dose usually given at the first injection in adults is $\frac{1}{400}$ grain. A burning or stinging sensation results and lasts for a few minutes. In from 2 to 6 hours a slight erythema and swelling appear. The degree of cellulitis varies greatly in different subjects, and great variability in susceptibility is often shown by the same subject. On an average the maximum amount of local irritation is obtained in from 24 to 36 hours after an injection, and by the third or fourth day the part has usually regained its normal condition. A second dose should not be given until all evidence of local reaction from the first injection has disappeared. As a rule it is better to wait for 7 or 10 days, and the strength of dose at the second injection should never exceed the first. If the strength of the second dose be increased, there is a danger of severe local and system reaction due to anaphylaxis.

Crotalin will produce an eosinophilia if a large enough dose is given. As a rule its extent varies with the severity of the local reaction, but this relationship is not invariable. It is unwise to

depend on the degree or character of the local reaction for the purpose of regulating the dose and frequency of administration. The susceptibility of the patient to croctalin can be determined by the degree of eosinophilia produced. It is best not to have more than an 8 to 10 per cent. increase. A second injection should not be given till the eosinophil percentage has returned to normal. Spangler claims that croctalin in properly regulated doses modifies the severity of epileptic attacks and lengthens the interval between the seizures. It improves the general health and metabolism of the patient. No hæmolytic effect is produced. In females functional menstrual disturbances are often much relieved. The mentality of the patient is favourably influenced. Fear of an impending attack frequently disappears. The patient may regain so much confidence that a regular occupation can often be followed. The best results are obtained if bromide or other sedative treatment is gradually withdrawn and eventually withheld. It is preferable for an epileptic to have an occasional seizure and to possess a clear mind and a healthy body, rather than to have the general health undermined and his mentality dulled by the use of sedatives.

A. G.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

THE SO-CALLED FROZEN FEET OF THE TRENCHES—TRENCH-FEET.

No satisfactory term has yet been suggested to apply to the condition of the feet which has incapacitated so many of the troops who have been engaged in the entrenched warfare in the north of France during the winter months. The ready-made term "frost-bite" is that most generally applied, but it is evident that the condition in many respects differs from that which occurs in those who have been exposed to intense cold for prolonged periods. During the present campaign the frost has not been intense, and although the weather has been extremely trying, this has been chiefly due to heavy falls of rain and sleet accompanied by high winds. The temperature has seldom been much below freezing-point, and the men have not had to stand in snow for long periods. Nor do the lesions produced resemble those described by Laury under the name *gangrène de congélation*. Actual gangrene is neither a prominent nor a constant feature of the condition, and when it occurs it is usually limited to patches of skin or to parts of one or two toes. The terms "frosted feet," "frozen feet," and *piéd gelé* are no more satisfactory; and to substitute "water-bite" for "frost-bite," as has been suggested, is futile. Some French writers draw a distinction between "*les gelures*" and "*la gangrène de congélation*"—applying

the former term to the prevailing affection now under consideration, and reserving the latter for the true frost-bite. Others, apparently recognising that the condition is merely one of exaggerated chilblain, speak of it as *engelure*. It appears to us that the term "trench-feet" might be employed for want of a better.

The classical description of frost-bite is contained in Larrey's *Mémoires de Chirurgie militaire et Campagnes*, tome iii. (Paris, 1812). According to his description, the French soldiers, before the battle of Eylau, did not experience any painful sensation during the continuance of the severe cold to which they had been exposed in the early days of February, and it was not until the second day after the battle, when the temperature had risen from -4° to $+43^{\circ}$ F., that they felt the first effects of cold, complaining of acute pain in the feet, and of numbness, heaviness, and prickings in the extremities. The parts were scarcely swollen, and of an obscure red colour. In some few cases a slight redness was perceptible above the roots of the toes and on the back of the foot, while in a few others the toes were destitute of motion, sensibility, and warmth, becoming already black and, as it were, withered. The progress of the disease was rapid, and, as a rule, it only implicated the toes. Larrey laid great stress on the fact that it was not the action of cold which determined the gangrene, but the sudden exposure of the parts to heat. "Woe to the man benumbed with cold," he says, "if he entered too suddenly into a too warm room, or came too near the great fire of a bivouac. The benumbed or frozen extremities . . . were struck with gangrene, which manifested itself at the very instant, and developed with such rapidity that its progress was perceptible to the eye."

We quote these well-known opinions to emphasise the fact, which is now generally recognised, that the affection of the feet which has accounted for so much disablement among the troops in the present campaign is not the frost-bite with which we have previously been familiar. It is an interesting fact, by the way, that the fingers, nose, and ears are almost never implicated, while in true frost-bite they very often are.

It is generally conceded that in the causation of the condition cold is only one factor, and that prolonged soaking of the feet in water and mud is another. It seems probable, however, that compression of the limbs and feet by gaiters, puttees, and tight boots is the determining factor, by interfering with the circulation of the feet. Under these conditions degenerative changes occur in the endothelium of the capillaries and smallest arteries and veins, and admit of serum escaping, giving rise to œdema. It is possible also that the structure of the peripheral nerves is altered by coagulation of axis cylinders.

Experience has shown that the condition may be met with at different stages or in different degrees, in some cases the symptoms

being purely subjective, while in others there are obvious morbid appearances in addition.

In the earliest stage the feet appear normal, but there is cutaneous anaesthesia and analgesia. In some cases there are patches of hyperaesthesia. The anaesthesia chiefly affects the toes and the heel, while the arch and sides of the foot are hyperaesthetic. The deeper parts are often painful on movement or pressure. The present writer has met with a number of cases in which the patients complained of severe cramp-like pains in the sole of the foot, particularly at night. These patients, who had been for long in the trenches, were under treatment for wounds of varying severity and not for the condition of the feet, and they were all peculiarly nervous and sleepless. The pains were relieved by bathing the feet in warm soda solution and by gentle massage.

In more advanced stages the condition of the feet alone is sufficient to incapacitate the patient. The feet are swollen, of a bluish-red colour, sometimes with a large blackish-brown bullæ here and there. There is marked œdema, which may extend well up the leg, reaching even to the knee. The foot is anaesthetic, but there is pain in the leg. When the bullæ burst a purplish area is exposed, which later becomes grey and undergoes necrosis, the superficial slough being separated in a few days. One or more toes, usually including the great toe, may become gangrenous, and gradually be thrown off. In exceptional cases the necrotic process spreads to the deeper tissues of the foot, and tunnels, lined with greyish, sloughy material, form in various directions.

Considerable attention has been directed towards devising means for preventing the development of "trench-feet." The men have been instructed to avoid the tight application of puttees, to leave the laces of the boots slack, and to take care that the boots are not rendered too tight by the wearing of extra socks. As it is impossible to keep the feet dry for any length of time under existing conditions, attempts have been made to protect the limbs against the action of the water by smearing them with grease or vaseline. Piédallu (*Bull. de l'Acad. de Méd.*, 26th January 1915) gives conclusive evidence of the value of this precaution. He has collected information from various medical officers who have instituted the practice amongst the troops under their directions, and they all agree (1) that the *gelures* have diminished in number, and (2) that the cases observed have been less severe. One soldier inadvertently performed an interesting experiment by applying the grease to one foot only. This foot escaped while the other was badly frost-bitten. Another proof was afforded by the fact that among a number of soldiers occupying the same trenches, those who had greased the feet did not suffer, while those who had not did.

To obtain the best results it is necessary to smear the feet thoroughly and to saturate the socks and the lower part of the

drawers with the grease, and as this requires about 400 grammes of grease, it is necessary to ensure a ready supply on the spot. This Piédallu has done by making up an ointment composed of 90 parts suet, 8 parts oil of ox foot, and 2 parts petrolenn. The practice amongst British soldiers is, after washing and drying the feet, to smear them with whale oil or some other animal grease, and then to put on dry socks and boots. After leaving the trenches the feet are washed in cold water and dry footgear is put on.

François Debat recommends the practice of simple exercises, as suggested by Jacquet under the high-sounding name of *la méthode bio-kinétique*. The soldier is warned to avoid standing long in one position in the trenches. On the first sign of numbness he should actively move his feet to stimulate the circulation. As a simple means of effecting this, he suggests that, acting in pairs, neighbouring soldiers should alternately kick the soles of one another. Two minutes of this interesting game, he says, will warm up the feet. All constriction of the legs and feet by puttees or tight socks must be avoided. He also recommends the application of grease to the feet.

For the milder degrees the treatment consists in thorough cleansing of the feet, keeping the patient in bed with the feet raised on pillows and protected from the weight of the bed-clothes by a cage, applying a dry, non-irritating dusting powder, and a covering of cotton-wool. As the swelling subsides gentle massage is used.

Debat reports favourably on the bio-kinetic method of Jacquet, which, in plain language, aims at re-establishing a normal circulation by means of massage and exercises. Massage has always been employed in the treatment of frost-bite since Larrey recommended rubbing the frozen parts with snow. To carry out the appropriate exercises, the patient lying on his back raises the limbs to a convenient height, and then alternately flexes and extends the ankles and the toes rapidly and energetically for about five minutes. This is repeated every few hours, and in the intervals he remains in bed with the feet supported on pillows or the foot of the bed on blocks. Unless the frozen parts are blistered or ulcerated no dressing is required, but the weight of the bed-clothes should be taken off the feet by a cage. When the skin is broken, in addition to applying the principles involved in the above methods, local applications must be employed. There seems no consensus of opinion that any one application is of special efficacy, but in different hands peroxide of hydrogen, zinc sulphide lotion, ichthyol, and other preparations have given satisfaction.

When gangrene supervenes amputation may be called for.

TUBERCULOUS CERVICAL ADENITIS.

At a combined meeting of the Sections of Medicine, Surgery, and Tuberculosis of the Massachusetts Medical Society (*Boston Med. and*

Surg. Journ., 7th January 1915) the subject of tuberculous cervical adenitis was discussed in all its aspects. One of the speakers, Dr. John B. Hawes, seems to have focussed the discussion when he remarked that "cervical adenitis is but a form of tuberculosis, and we are treating not a few enlarged glands in the neck, but a human being suffering from an infection with the tubercle bacillus." This raised the question of the source of infection, and Dr. George L. Richards dealt fully with the anatomical arrangement of the different groups of glands and their respective areas of drainage. While he attaches considerable importance to the tonsils as a protective agency in the early years of life, he admits, with G. H. Wright, that tubercle bacilli may invade and pass through the faucial tonsil without producing tuberculosis of the tonsil itself. As a result of his experience he is inclined to recommend that in all cases of cervical adenitis the tonsil should be removed as the first procedure. One can always reassure the parents of such children, he says, that in all probability the cervical adenitis is not an accompaniment of a general pulmonary tuberculous process. Other speakers deprecated too frequent resort to removal of the tonsil, and James B. Stone drew attention to the fact that after this operation lymphoid tissue is apt to develop along the posterior pillars of the fauces, and this may prove a source of trouble. Dr. H. D. Chadwich referred particularly to tuberculin treatment, which in his hands had yielded very satisfactory results so long as the patient was under continuous supervision and had the benefit of sanatorium treatment. This plan has been specially satisfactory in children. The initial dose is one-millionth of a milligram, and the course of treatment extends over a period of about six months until we reach ten milligrams. A small dose given over a long period is most efficient. Surgical interference is only necessary to remove such glands as have become caseous or fibroid.

Dr. Hawes remarked on the change which has come over the treatment of tuberculous adenitis during the past fifteen years. The so-called radical operation which was for a time so popular was neither radical nor curative, and often left large and disfiguring scars. Without denying that wholesale removal of glands is the best procedure in certain cases, he believes that where there are large, discrete, isolated masses, without suppuration, removal of these masses without any attempt to do a complete dissection is frequently a measure of greatest value. He speaks favourably of tuberculin treatment in preventing recurrence after operation, in the treatment of persistent sinuses, in children with numerous scattered glands, and in large masses with much periadenitis in adults. The importance of general hygienic treatment is strongly emphasised. Stone says that cases of tuberculous lymphadenitis should be treated either as glands or as abscesses. If enlarged glands are not subsiding within a couple of months, they

should be removed surgically. If this is not possible, they should be encouraged to break down by poulticing or by other means of inducing active hyperemia, which will produce a protective inflammatory zone around them. The abscesses are then opened, scraped, and packed with wick or gauze.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

INTERMITTENT HYDROSALPINX.

UNDER the term intermittent hydrosalpinx or *hydrops tubæ profluens* there lies concealed a somewhat elusive morbid entity, an entity to which Dr. Paul Wanner (*Rev. méd. de la Suisse Romande*, 20th October 1914, xxxiv. 698) tries to give clearer definition. For this purpose he narrates a case. His patient, a married woman of 36 years of age, had an uneventful infancy and childhood, and menstruated for the first time when 16. From her eighteenth year she noticed that she was often wet; at first she attributed the discomfort thus produced to passing urine, but was struck by the fact that the liquid did not stain her linen. Her general health was not interfered with, but she noted a slight distension of the abdomen from time to time. When twenty-five years old she married, but no pregnancies occurred. Until 1911 she continued to have small losses of fluid, and the abdomen was slightly swollen from time to time; after that year the discharge became greater in amount and more troublesome; it also became irregularly intermittent, and a small dose of purgative medicine would bring it on. More recently the losses had been still greater, and were brought on by slight movements, as in laughing, running, and the like; she had to wear a diaper. Menstruation remained normal and had no apparent effect upon the discharges. Still more recently the losses had become regular, occurring every three weeks; the abdomen had also become more distended, and the patient thought there was a sort of reservoir for the fluid on the right side. The physical examination revealed a fatty abdominal wall and a swelling above Poupart's ligament on the right side. This swelling was slightly tender on pressure; it gave to the fingers the sensation of a resistant, slightly elastic, fluctuating, but ill-defined mass. The uterus was small and exhibited distinct sinistro-version; the sound, when introduced, passed distinctly to the left side. Immediately after the uterine sound had been withdrawn a clear fluid began to pass from the patient; it amounted to nearly half a litre, was free from albumin, had a specific gravity which was less than that of water, and left no deposit when allowed to stand. Thereafter the bimanual examination showed that

the uterus was in its normal position and was freely movable in all directions. There could be no reasonable doubt that the patient was the subject of hydrosalpinx.

Dr. Wanner regards complete closure of the ostium abdominale as a necessary precedent to the development of hydrosalpinx, and he points out that when the uterine orifice of the tube is also closed the salpingeal sac may attain a large size and be mistaken for an ovarian tumour. In cases of *hydrops tubæ profluens*, however, the swelling is never so large, for its contents are periodically or constantly escaping. It is a rare morbid state, Martin having met with no more than four instances of it in five hundred diseased tubes. Its diagnosis is not always easy, although it was so in Wanner's patient; and it is liable to be confused with ordinary hydrosalpinx, with hæmatosalpinx, pyosalpinx, subperitoneal fibroids, hæmatometra or hydrometra in a separate uterine cornu, tubal pregnancy, various tumours of the ovaries and tubes, and with inflammatory exudates. The absence of fever and the intermittency of the phenomena are useful diagnostic indications of hydrops profluens. The morbid state rarely undergoes spontaneous cure, and even when there is a tendency in that direction it is hindered by the existence of adhesions between the tube and the surrounding organs. The present-day treatment is operation by the abdominal route.

Dr. Wanner confirmed the diagnosis and brought about a cure by abdominal section. He found the salpingeal sac markedly adherent to the floor of the pelvis, and was only able to remove four-fifths of it. Indeed the attempt to remove the whole was followed by tearing of the parts and alarming hæmorrhage; it was necessary to suture the tear and to stitch the peritoneum over the part of the sac which had to be left behind. The patient made a good recovery. The only matter of interest which the specimen exhibited was hypertrophy of the tubal musculature; in ordinary hydrosalpinx the opposite condition of thinning, with atrophy of the muscular coat, is produced.

INTRA-UTERINE STEM PESSARIES.

Dr. W. R. Nicholson (*Amer. Journ. Obstet.*, 1914, lxx. 608) begins an article on dangers in the use of the intra-uterine stem with the following somewhat surprising sentence:—"The frequency with which this little instrument is used at the present day and the steady increase in the number of its advocates renders the above question (its dangers) one of much importance." Now, if there is one matter about which gynecologists, in Great Britain at least, would be likely to agree, it is that the use of pessaries, and especially of intra-uterine pessaries, has been steadily decreasing for several years, and that the whole-hearted advocates of these little instruments are few and far between. Dr.

Nicholson of Philadelphia, however, is of an opposite opinion, and thinks it necessary to record as a warning certain dangers which may follow the use of the stem. A patient who had been suffering for some years from dysmenorrhœa and sterility applied to Dr. Nicholson for advice. He first had her husband examined, and after getting a clean bill of health regarding him, he agreed to operate upon the wife. She was first examined under ether, and an acutely anteflexed, mobile, and well-developed uterus was discovered; the ovaries were a little smaller than usual, and there were no signs whatever of any infection, recent or of old standing. Cervical dilatation and a gentle curettage were performed; a stem pessary was inserted; and a Smith-Hodge pessary was also put into the vagina in order to retain the stem. No evil effects followed, and the patient left the hospital in which the operation had been performed at the end of a fortnight. A week later Dr. Nicholson was sent for, and found her suffering from intense pain in the right lower quadrant of the abdomen; her temperature was 103°, her pulse 120, and her respirations were quickened; some pains in the limbs and back were complained of. At first Dr. Nicholson hoped that the symptoms might be explained by influenza, but a pelvic examination soon convinced him that an infection had occurred about the uterus. There was acute tenderness in the right vaginal fornix, and, as the appendix had been removed previously, no suspicion of appendicitis could be entertained. It was discovered that the patient since she left the hospital had been douching herself, and that intercourse with her husband had taken place on one occasion. The intra-uterine stem was at once removed, but symptoms pointing to pelvic peritonitis continued, and in the end the abdomen had to be opened and the uterine appendages removed. Dr. Nicholson was able to save the major part of the left ovary and about two inches of the corresponding tube, but the right ovary was much enlarged and the seat of cystic degeneration. The patient made an uneventful recovery, but, as the author says, the case was a most unfortunate one, and the treatment resulted in a young healthy woman, with normal organs and suffering only from slight dysmenorrhœa, but being very desirous of having children, being left in a mutilated state with no hope of a pregnancy. Dr. Nicholson considers all the possibilities, and believes that he is able to exclude infection before and at the operation; he thinks that the infection followed the return of the patient to her home, and was due to the stem pessary, the actual infecting poison coming either from the sexual act or more probably from the employment of non-sterile douches. Most gynecologists are doubtless well aware of the risks accompanying the insertion of stem pessaries, especially when they are introduced at the time of or immediately after curettage, and more particularly when they are accompanied by the use of a vaginal pessary; but the reporting of such a case as Dr. Nicholson's may serve a valuable purpose in

keeping alive a wholesome dread of these instruments, particularly in the case of patients not under professional observation.

RUPTURE OF A BICORNUTE PREGNANT UTERUS.

It is interesting to be able to refer to an interesting report of the rupture of a malformed uterus occurring in far-off Saskatchewan. Dr. G. A. Wright of Saskatoon (*Western Medical News*, 1914, vi. 213) not only records the case, but he was also able to operate successfully upon it. The patient was a married primipara of 18 years of age. When about four and a half months pregnant she was seized with violent pain in the abdomen while walking across the floor. When Dr. Wright reached her she was complaining of pain in the hypogastrium, with marked distension of that region. Her pulse was a hundred, and she was semi-conscious. The temperature was normal. A very tender mass, resembling the gravid uterus, was felt in the pelvis. The woman was removed to the hospital, and as she was no better on the evening of the following day Dr. Wright, assisted by Dr. H. E. Munroe, opened the abdomen. The cavity was found to contain blood-clots and a fœtus of about five months, with placenta and membranes. These were removed, the abdomen was flushed out, and then it was discovered that the uterus was bicornute, and that the left cornu (the one which had been pregnant) was ruptured. There was only one cervix, and the ruptured cornu was clamped just above it and removed with the tube and ovary. The abdomen was flushed with saline; its cavity was also filled with saline and closed, a tube being left in for drainage. On the third day after the operation the patient expelled a cast from the right uterine horn; she made a good recovery, and was able to be moved to her home on the twenty-second day. Ten and a half months later she became pregnant, and she was delivered comparatively easily under Dr. Wright's care at the full time; the only anomaly was the presentation of the infant by the breech. The labour lasted six hours, and, although Dr. Wright was prepared to dilate the cervix and deliver early for fear of rupture, the progress made was so satisfactory that he determined to leave the expulsion of the child to the natural efforts. Previous to the opening of the abdomen the operator was in doubt whether he had to do with a ruptured tubal pregnancy, a perforated gastric ulcer, or an acute appendicitis; abdominal section enabled him to clear up the diagnosis, and doubtless saved the patient's life.

J. W. B.

LARYNGOLOGY, OTOTOLOGY, AND RHINOLOGY.

UNDER THE CHARGE OF

A. LOGAN TURNER, F.R.C.S., J. S. FRASER, F.R.C.S., AND
W. G. PORTER, F.R.C.S.

“NOISE DEAFNESS.”

AT the present time the effect of loud sounds upon the auditory apparatus is of considerable interest, not only to the medical profession, but to the general body of laymen. Our attention has been more closely drawn to the subject recently by following the clinical investigation which has been carried out by Dr. Ritchie Rodger, and now published in the *Journal of Laryngology* (March 1915). Dr. Rodger commences by giving a very interesting account of the more recent experimental work upon animals, and it will not be out of place, in the first instance, to note the effect of loud detonations upon the organ of Corti, and to briefly note the microscopic changes thus produced. Yoshii exposed one of the animals in his series of experiments to the detonations of a revolver fired at a distance of 20 cm. When the shot was fired the animal was greatly frightened, lost its liveliness, and became very slow in its movements. A few moments later it hardly reacted at all to handclapping. It showed, however, neither nystagmus nor disturbance of equilibrium. At the end of five minutes the animal was killed. The changes observed in the ears were interesting. On the right side there was a large perforation in the lower part of the tympanic membrane. The mucous membrane of the tympanum was hyperæmic, and there was a small amount of blood in the tympanum. Examination of the inner ear, on the other hand, revealed no change. Corti's organ was normal in every part. No bleeding or exudate was seen anywhere. The sacculæ, utricle, ampullæ, and semicircular canals were normal. A marked contrast to this was observed in the left ear. Here the tympanic membrane and middle ear cavity were quite normal. In the inner ear, however, distinct changes were noticeable. Corti's organ showed the boundaries of the hair cells and Deiters' cells somewhat obliterated, Hensen's cells flattened, and the pillar cells pressed in. We have, in this experiment, on the right side the violence of the sound waves destroying the tympanic membrane, and thus dissipating the air pressure so as to save the auditory end organs in the cochlea. On the other hand, on the left side the preservation of the sound-conducting medium caused the full shock to be conveyed to Corti's organ, with the consequent alterations above noted.

The absence of injury to the internal ear on the right side due to the middle ear lesion in this experiment affords strong evidence that the shock is conveyed to the labyrinth through the medium of the

external auditory meatus and tympanum, in other words by air conduction. There is further experimental evidence supporting this. Thus von Eicken and Hoessli removed the incus from one ear of animals which were then exposed to loud noises. In every case it was afterwards found that the internal ear on the side thus operated upon had escaped injury, while the labyrinth on the other showed the changes similar to those already described. The same results were observed in an animal the subject of middle ear disease on one side, the cochlea on that side escaping injury, while that on the other side did not. If further proof upon this point were required, it may be found in the results of experiments upon animals exposed to noise, by insulating them, so far as bone conduction is concerned, by a matting of felt placed on the floor of the cage. This measure had no effect in preventing the labyrinth changes. It may be taken as conclusively established that it is by way of the chain of ossicles and oval window that the excessive impulses reach the inner ear in this form of deafness. We have emphasised this point because it has been disputed, and, further, on account of the practical lesson which must follow its proper appreciation. If injuries to the organ of Corti resulting from exposure to noise did not reach the labyrinth by air conduction, but only through the bone, then the customary advice to people exposed to such dangers, to protect the ears by some form of obstruction in the external auditory meatus, would be useless. We will refer to this point later.

The advances made during recent years in the clinical examination of the vestibular portion of the internal ear must naturally increase our interest in the effect produced by detonations upon the semicircular canals. Yoshii found that when animals were exposed to revolver shots, marked disturbance of equilibrium was noted. To quote his own words, "After the first shot in front of the right ear nothing striking happened, but shortly after the second shot was fired close to the left ear the animal drew his head to the left and at the same time executed rhythmic pendulum movements to the same side in a horizontal direction. Both eyes were markedly deviated to the left, and at the same time an undoubted nystagmus developed." The minute examination revealed in addition to cochlear changes, hæmorrhage in the sacculæ and utricle, in the vestibular nerve a varicose formation of fibres, less marked than in the cochlear nerve, while the epithelium of the maculæ and of the cristæ ampullares was swollen.

We will doubtless accumulate during the present war a sufficient amount of clinical material in connection with the effect of high explosives upon the auditory apparatus to permit us to return to this subject on a future occasion.

We must next turn to the second part of Rodger's paper, which deals with the incidence of noise-deafness in those whose occupation

exposes them intermittently to loud sounds. Before doing so, however, it is necessary to observe the pathological changes which have been noticed in animals the subjects of experimentation. In this connection the experiments of Wittmaack are quoted by Rodger. Guinea-pigs confined in cages were exposed to the continuous sound of an electric bell, while others were similarly exposed during the daytime only. Another group of animals were exposed to short intense noises often repeated. As the animals exposed to the noise during the daytime only approximate more nearly to the conditions existing in noisy occupations, we will only quote here the post-mortem changes found in the internal ear in this group. In the organ of Corti the changes ranged, according to the severity of the pathological process, from slight swelling of the hair cells and their supporting cells to such an extensive atrophy of the whole end-organ that nothing of it remained beyond the merest fringe of flattened epithelium. Cases of moderate severity showed vacuole-formation in the hair cells and rod cells, the latter losing their upright position. Deiters' and Hensen's cells had lost their characteristic structure, and in their place was found a heap of cubical and cylindrical cells becoming gradually more and more flattened.

Rodger examined forty-eight men whose occupation exposed them to loud sounds. Forty-four were boiler-makers and rivetters, two were blacksmiths, one an engineer, and one a brass-finisher. Care was taken to procure a proper proportion of the younger men, so that the condition might be studied in relation to the length of time the trade had been engaged in. He divided the cases into three groups: (i.) men who had been employed for less than ten years at the work; (ii.) those from ten to thirty years; and (iii.) men employed for over thirty years. Hitherto, it has been generally taught that a marked loss of hearing for high tones is the typical condition found in individuals exposed to loud sounds. The author's observations, however, elucidate this very interesting fact, that in the earlier stages, at least, the condition of noise-deafness does not affect principally the perception of high tones. In the workmen in group (i.), who had been employed for less than ten years, the upper tone limit was scarcely affected, but, on the other hand, there was marked loss of hearing for tuning-forks corresponding to the noises that were predominant in the workshop. These noises were of the nature of the low rumbling of the machinery, and for a considerable time the depreciation of hearing is mainly for sounds of a pitch corresponding to these noises. None of the men in group (i.) had sought advice on account of deafness, because it had not proved of sufficient inconvenience. In groups (ii.) and (iii.), however, where more than ten years had been spent at such work, and where the effects of the exposure had become more advanced, marked loss of hearing for high notes was developed, giving the clinical picture hitherto accepted

as typical of the condition. It is at this stage that advice is sought, and hence the view that is generally accepted regarding occupational deafness.

It is apparent that the pathological condition is an exhaustion atrophy from over-excitation, affecting primarily the parts of the cochlea corresponding to the prevailing sounds. In railwaymen exposed to the shrill notes of the engine whistle, Pucelli found the damage in that part of the cochlea concerned in the perception of high notes.

In the workmen examined by Rodger subjective noises were complained of in 56 per cent. Most of the apprentices said that they had noises after leaving their work at night, and many of the older men, who at first denied the existence of this symptom, admitted, when more closely questioned, that in their earlier years they had suffered from tinnitus.

Giddiness, indicative of disturbance of the vestibular apparatus, was a symptom in 10 per cent. of the cases. When we consider how much the sounds of hammering on metal are of the character of repeated detonations, it is not surprising if we find amongst workmen signs of vestibular change. Habermann found post-mortem, in the victims of noise-deafness, increased pigmentation in the ampullæ of the semi-circular canals and hyperplasia of the conical ridges. The author found, in carrying out the cold water syringing test for the induction of nystagmus, that this physiological phenomenon was delayed beyond the normal period of 25 or 30 seconds in each of the above defined groups of workmen. Thus in group (i.) the induction period was 33 seconds, in group (ii.) 44 seconds, and in group (iii.) 50 seconds. Even in the early cases there is slightly diminished sensibility of the vestibular apparatus, while in the established cases this becomes quite marked.

The conclusions come to by Rodger are as follows:—(1) That loss of hearing for high notes is not, as hitherto taught, the outstanding feature of noise-deafness. (2) That the predominant noises to which the individual has been exposed determine the site of the initial lesion in the inner ear, and that for a considerable time the depreciation of hearing is mainly for sounds of a pitch corresponding to these noises. (3) That later, the unusual vulnerability of the lowest part of the cochlea gives rise to marked loss of hearing for high tones. (4) That the vestibular apparatus in such occupations as boiler-making, where loud hammering is being carried on, is also affected, although in less degree than the cochlear apparatus.

Rodger naturally refers to the question of prophylaxis and as to how far suitable means may be employed for preventing injury to the inner ear from exposure to loud noise. This is a matter which must not only be of interest to boiler-makers, etc., but must claim the atten-

tion of all in the present crisis. As there is ample proof that the injurious vibrations reach the inner ear through the external meatus and tympanum, and not by bone conduction, it is obvious that meatal plugging, in spite of the doubt which has been thrown upon its efficacy, does afford considerable protection to the hearing. It is probably a matter of common experience to find that the boiler-maker and the rivetter do not take the trouble to protect themselves by any device of this kind, because they believe that nothing will prevent the deafness. Different materials have been recommended for the purpose. Cotton-wool is handy, and has the advantage that a fresh piece can be employed daily, and thus cleanliness is more readily ensured. Dry cotton-wool, however, is of very little value, but if smeared with vaseline or other material it becomes more efficacious. Plasticine worked into cotton-wool forms a serviceable plug, and other forms have been devised with the same object in view. McKenzie draws attention to a practical point in the use of plastic meatal plugs which deserves note. After the plug is packed into the meatus, the air contained in the canal, becoming warmed, expands and causes an unpleasant sense of fulness or pressure in the ears. This can be easily remedied by releasing the plug for a moment, so as to allow the escape of the excess of air. The whole question is one deserving of greater attention amongst those who are thus exposed, whether boiler-makers, rivetters, artillery men, naval gunners, or sportsmen.

A. L. T.

PATHOLOGY.

UNDER THE CHARGE OF

THEODORE SHENNAN, M.D., AND JAMES MILLER, M.D.

KALA-AZAR IN PORTUGAL.

IN 1910 the existence of infantile kala-azar in Lisbon was demonstrated by Alvares, who discovered *Leishmania* in the spleen of a girl, nine years old, which had been removed by operation. Since that date nine other cases have been observed, the ages of the affected children varying from nine months to nine years.

Further, out of 416 dogs, caught in different parts of Lisbon, 13 were found to be suffering from the same disease.

Da Silva's investigations (*Arquiv. do Instit. Camara pestana*, June 1914) were directed towards the solution of the question as to whether the disease was transmissible from man to the dog, or *vice versa*, and, if the latter, what was the agent in transmitting the parasite.

The disease in the dog is not recognisable clinically, but only by examination of smears of liver obtained by puncture, or, better still, by examination of bone-marrow, obtained by trephining one of the long bones. A long series of experiments is detailed. A parasite appar-

ently corresponding in its characters to *Leishmania* was found in a small proportion of the fleas (*Ctenocephalus canis*) captured on infected dogs, and in fleas (*Pulex irritans*) found on the clothing of children suffering from the disease. On allowing these to feed upon healthy dogs, no infection was transmitted in any case.

He concludes that either the experimental conditions did not sufficiently correspond to the natural conditions under which infection of man occurs, or that the parasites found in the intestinal contents of the fleas were not *Leishmania*, or that, if actually *Leishmania*, the parasites had not attained the stage of development at which they could infect dogs.

THE RESULTS AND INTERPRETATION OF THE WASSERMANN TEST.

Craig (*Amer. Journ. Med. Sci.*, January 1915) is convinced, from his experience of over 18,000 tests, that this reaction, when properly performed, is of inestimable value, not only in the diagnosis of the disease, but also as a control of the efficiency of treatment; that it is irrational to regard a patient as cured of syphilis so long as either the blood or cerebro-spinal fluid reacts positively; that the positive reaction, if persistent, means the presence, somewhere in the body, of living spirochetes.

Further, even an evanescent positive result, if obtained after a provocative dose of salvarsan or neo-salvarsan, proves the persistence of infection. "The reaction is only of value if reported on by a trained serologist, and the profession should frown upon the tendency, only too well known, of submitting blood for this very technical test to laboratories of doubtful standing because of financial considerations."

He is firmly of opinion that really positive results are obtained as often with one method of carrying out the test as with another, provided those using the various methods are skilled in their use.

In primary syphilis he found that 34 per cent. of his cases gave a positive reaction by the end of the first week after the appearance of the primary chancre; over 57 per cent. by the end of the second week; 67 per cent. by the end of the third week; 76 per cent. by the end of the fourth week; and 80 per cent. by the end of the fifth week. A single negative result during this stage is of no value in excluding syphilis.

In undoubted syphilitics, untreated, the reaction may vary in strength from day to day, or even disappear temporarily.

The ingestion of alcohol, in practically any form, is capable of rendering a positive reaction negative, and the reaction may remain negative as long as three days.

Growth of bacteria in the serum may cause a positive reaction to be given by a serum which is really and primarily negative.

Hence strict asepsis should be observed in the collection of the blood.

The largest percentage of positive results is obtained if the maximum amount of serum allowable with the particular method be uniformly used, and reports of doubtful or negative reactions are worthless unless based upon the result obtained with the maximum amount of serum.

Before a patient is declared free from syphilitic infection, the cerebro-spinal fluid should be tested, even though the Wassermann test with the blood-serum is negative.

The provocative test is of the utmost value, and should be applied not only to decide whether a patient is, or is not, cured, but also where there is good reason to suspect syphilitic disease.

At the present time the physician who neglects the use of the Wassermann test in the diagnosis and treatment of syphilis is doing a great injustice to his patients. This test has conclusively demonstrated that many of our clinical conceptions of syphilis are erroneous; that the disease may be present for years without producing symptoms sufficient to attract the attention of the individual infected; that the ease with which it was supposed to be cured by mercury and other drugs, even including the best of all specifics—salvarsan—is a dangerous fallacy: and that syphilis must be regarded as one of the most insidious and persistent of all the infections occurring in man.

TRACHOMA.

Ernesto Paparcone (*Lo Sperimentale*, January 1915, p. 685) has repeated the attempts of Noguchi (*Journal of Experimental Medicine*, November 1913) to cultivate the so-called "trachoma bodies."

He followed closely Noguchi's method, which consists in incubating at blood temperature scrapings from, or excised portions of, trachoma granulations, in tubes of sterile ascitic fluid, to each of which a small portion of fresh sterile rabbit's kidney has been added.

Anaerobic conditions are attained by covering the culture fluid with 2 to 3 cm. of sterile paraffin, and enclosing the tubes in a chamber from which the oxygen is exhausted by pyrogallic acid.

After 10 days' incubation films of the culture fluid are examined after staining with Giemsa's fluid.

The purification of the cultures presents difficulties, which Paparcone discusses fully. He examined seven cases from which dried film preparations showed the presence of numerous trachoma bodies, and succeeded in obtaining in his cultures, without other organisms, formations identical with those described and figured by Noguchi as the organism of trachoma.

He expresses grave doubts as to their nature, and recalls the fact that Volpino (*Patologica*, January 1914), in his attempts to cultivate the virus of rabies, after a similar method recommended by Noguchi, found similar bodies, not only in inoculated tubes, but in the control, uninoculated tubes.

Paparcone suggests, seeing that success in inoculating monkeys has not been attained by use of such "pure cultures," that these bodies are really the products of cell degeneration, and are derived from the rabbit's tissue which had been added to the culture medium.

VARIETIES OF PNEUMOCOCCUS AND THEIR RELATION TO LOBAR PNEUMONIA.

Dochez and Avery (*Journ. of Exper. Med.*, February 1915) discuss important questions which have arisen in connection with the nature of the infection in lobar pneumonia, and which have a bearing upon the importance of the employment of autogenous vaccines rather than stock vaccines in the treatment of pneumococcal diseases.

The authors find that pneumococci isolated from individuals suffering from lobar pneumonia present constant differences, which permit of their being classified into distinct groups. These have been studied not only in the United States, but also by Lister in South Africa. In the United States four groups have been distinguished, and in South Africa five groups. The first three groups consist of varieties of pneumococci which within the group are closely related to each other by certain immunological reactions, *e.g.* protection and agglutination.

Extensive study has failed to reveal crossing in either of these reactions between members of separate groups. The fourth United States group consists of a series of independent varieties which cannot be definitely related to one another by the immune reactions employed. Up to the present the authors have observed no tendency of these organisms to lose their specific characters or to change their type either on inoculation or on cultivation.

In South Africa, Lister separated five groups of pneumococci, the first three of which correspond to the first three isolated in the United States. The fourth and fifth groups, one of which seems to be dominant in South Africa, have not as yet been found in cases of pneumonia investigated by Dochez and Avery.

The prevalent idea with regard to infection in pneumonia is that it is an auto-infection by pneumococci dwelling during health upon the mucous membranes of the upper air-passages and mouth. Owing to a sudden access of virulence by the pneumococcus, or unusual lowering of the resistance offered by the host, the organism is supposed to become able to penetrate to the lungs and set up disease.

In view of this assumption it was thought advisable to investigate

the pneumococci occurring in the sputum of healthy individuals. Fifteen different strains were isolated and submitted to a large number of tests. The general result was to show that pneumococci isolated from normal human sputum do not belong to any of the fixed groups, *i.e.* Nos. 1, 2, and 3, but resemble, so far as the authors can determine, the heterogeneous group 4. The majority of the strains separated from sputum showed the morphological and cultural characters typical of the pneumococcus—encapsulation, bile-solubility, cultural and fermentative reactions.

In order to demonstrate still further the differences between pneumococci occurring in disease and those occurring in the normal mouth, the authors proceeded to study the disappearance of the fixed types from the sputum during convalescence from pneumonia. Only a few cases have been investigated so far, but they show that only in exceptional instances does one find in the sputum any considerable time after recovery the type of pneumococcus with which the individual was infected during the disease.

Lyll, in the same number of the journal ("Types of Pneumococci, in Tuberculous Sputum"), shows that in sputum from tuberculous lung cavities, pneumococci occur which correspond to those found in normal sputum, so that, even under such favourable conditions in man, no transformation of group characters takes place. Pneumococci corresponding to any of the three fixed types occur only infrequently.

With regard to the additional two groups separated by Lister in South Africa, Dochez and Avery think that the likely explanation is that among the white population there, as in the States, there occurs a number of cases of pneumonia due to infection by an organism resembling the sputum pneumococcus, *i.e.*, the slightly virulent group 4 of their classification. When such a pneumococcus is communicated to the blacks, its pathogenic history, in spite of its relatively low virulence, does not stop with the production of a single case of pneumonia, as it seems to do among individuals whose racial immunity is relatively high, but the organism is readily passed on to other susceptible blacks, and thus establishes itself in the less immune race as a permanently pathogenic type. It is possible that in South Africa the new races of pneumococci arising among the blacks may, after a number of generations, gain sufficient virulence to become highly infective for the relatively immune whites.

The suggestion is made that strictly parasitic races of micro-organisms are pure lines, and have established themselves as parasites during a period of high racial susceptibility.

It will be interesting to see if further investigations along these lines will confirm the conclusions arrived at by the authors.

T. S.

NEW BOOKS.

The Intensive Treatment of Syphilis and Locomotor Ataxia by Aachen Methods. By REGINALD HAYES, M.R.C.S.E. Pp. 63.

London: Baillière, Tindall & Cox. 1914. Price 3s. 6d.

THE paper, printing, and binding of this little book are excellent, but with these our commendation ends.

Mercurial inunction, as an excellent though dirty method of treating syphilis, has been known for generations, and Aachen has been universally recognised as the health resort when such treatment has been made a speciality, the sulphur water leading to a more free circulation and rapid elimination of the drug. That thoroughness and system are essential to any successful treatment is obvious, and that Aachen is not likely to be extensively patronised by the British at present or in the future is certain, and what this little book seems most anxious to prove is that Aachen methods can quite as efficiently be conducted in this country if superintended by one who has made a special study of them, but that otherwise inunction is unsatisfactory and dangerous. The latter half of the book is taken up with stating that syphilitic affections of the nervous system, and especially parasyphilitic conditions, such as general paralysis and tabes, are specially amenable to this treatment. Notes of illustrative but inconclusive cases follow which have been treated by the author, the names of numerous distinguished members of the profession who have entrusted their patients to his care being specially mentioned. Books such as this do not add to our scientific knowledge or to the reputation of the profession, and are in no way to be encouraged.

On Means for the Prolongation of Life. By Sir HERMANN WEBER, M.D., F.R.C.P. Pp. viii. + 235. London: John Bale, Sons & Danielsson, Ltd. 1914. Price 4s. 6d. net.

A BOOK of sound common sense, dealing with a reasonable way of life or *regimen* for grown-up people, whereby they may hope to reach what the author considers the "normal" term of life, namely, "about 100." Among the many eminently sensible views here enunciated we may note two which are undeniable, if by no means generally recognised, truths, viz. (1) that living tissues are not "worn out" but are actually developed by physiological use; (2) that most adults do not require more than $5\frac{1}{2}$ to 7 hours of sleep, and that more people harm themselves by too much than too little sleep. The author, now in his 92nd year, is to be thanked for having published the fruits of a long period of first-hand observation. We cordially hope that he will reach his century, and even then remain "not out."

Medical Diagnosis. By ARTHUR LATHAM, M.D., and JAMES TORRENS, M.B. Pp. 641. With 74 Illustrations. London: J. & A. Churchill. 1915. Price 15s. net.

THIS book has been written with the object of presenting, side by side, the clinical features and laboratory methods which together enable the practitioner to arrive at a correct diagnosis in any given case. The work is a comprehensive one, but its arrangement is simple and convenient. The authors have made full use of current text-books and literature in its production. For a first edition there are remarkably few omissions, and it is obvious that great care has been exercised in preparing the volume. Practically everything new is included, though we do not find any mention of the luetin reaction, nor of the significance of glycogen in the blood. Recent work on the heart is lucidly outlined. At the conclusion of the book there is a section dealing with diseases of the skin. This section is hardly of the same value as the rest of the book, as the diagnostic sections are not complete, and frequently the most important points are omitted. For example, under the heading *Pityriasis Rosea* no mention is made of the diagnosis from syphilis, which is far the most likely source of error. Taking the book as a whole, it is a valuable handbook for reference, conveniently arranged, and efficiently illustrated. The coloured plates are particularly well done, and the printing is excellent.

The British Pharmacopœia, 1914. Pp. xxxi. + 602. Published for the General Medical Council by Constable & Co., Ltd., London.

FRANKLY, the new Pharmacopœia is a disappointment, not so much perhaps from the omission of useful remedies from which official sanction has been withheld, as from the continued inclusion of many useless substances. The volume is, of course, very carefully and accurately compiled, its directions are plain and exhaustive in detail, and its printing and format leave nothing to be desired. An increase in the number of patent preparations which are standardised, and the introduction of the metric system of weights and measures, are features of this edition, and are steps in the right direction. The increase in strength of *tinctura strophanthi* will render the official 1914 preparation much more reliable than its predecessor, while the increase in strength of *tinctura opii* makes this less easily obtainable by the layman who has no prescription for it. Among the additions one notes with approval the inclusion of *pelletierin tannate*, a potent and much more pleasant agent for obtaining the effects of *granati cortex* than the old decoction. The old error "*Digitalis Folia*" *Digitalis Leaves* is repeated; this is unfortunate.

Erratum.—In the article "British Pharmacopœia, 1914," p. 123, line 4 from top, for "10 per cent." read "1 per cent."

The Book of Prescriptions. By E. W. LUCAS. Pp. 375. London: J. & A. Churchill. 1915. Price 6s. 6d. net.

THIS handy little volume is really more than it purports to be, because it is virtually a compendium of materia medica, with a series of useful illustrative prescriptions. These are well chosen, and with each prescription an indication is given as to the disease in which it might be expected to prove serviceable. Imperial measures with corresponding metric equivalents are given.

The Book of Pharmacopœias. By E. W. LUCAS and H. B. STEVENS. Pp. 524. London: J. & A. Churchill. 7s. 6d. net.

THIS useful and comprehensive compendium of the formulæ of the various London and provincial hospitals provides the student and practitioner with a wide range of prescriptions applicable to all manner of therapeutic indications. It affords to the inexperienced prescriber a practical illustration of how best to apply the remedy he desires to employ, and at the same time does not prevent him modifying the precise prescription to the particular therapeutic requirements of his case. The volume is one of much practical value.

On Pharmacotherapy and Preventive Inoculation Applied to Pneumonia in the African Native, with a Discourse on the Logical Methods which Ought to be Employed in the Evaluation of Therapeutic Agents. By ALMROTH E. WRIGHT. Pp. xii. + 124. London: Constable & Co., Ltd. 1914. Price 4s. 6d. net.

THIS book, as the author says in the preface, is a report on research which was undertaken in the hope of discovering some method of diminishing the ravages of pneumonia among the native labourers employed on the Rand mines. In order to do so, the writer, with his colleagues, sought to test a system of preventive inoculation against pneumonia, and to ascertain the nature of the resources available in pharmaco-therapy and vaccine-therapy. Sir Almroth Wright points out that in such an evaluation there are two methods of procedure which may be followed—the statistical and what he calls the experiential method. In discussing the former he has a good deal to say with regard to the attitude of Professor Pearson and his followers to those who would lay stress on methods less absolutely mathematical, and for himself he seems to give the undoubted preference to the experiential method in the hands of competent observers. Whilst the purpose of the book is largely to record the results of his investigations on pneumonia, many will probably find the chief interest in his attacks on those who do not see eye to eye with him respecting the relative value of statistics and competent experience. The book is one which is more suited for study by laboratory workers than by those engaged in ordinary clinical practice.

Mechano-Therapeutics in General Practice. By G. DE SWIETOCZOWSKI.
Pp. xiv. + 141. With 31 Illustrations. London: H. K. Lewis.
1914. Price 4s. net.

DR. SWIETOCZOWSKI has adopted a somewhat different method in planning his book from that which is usually employed in treatises on massage. The book is divided into three sections, the first of which is devoted to surgical conditions, including accident, disease, and deformity; the second to medical conditions, taking up the various systems in succession; and the third to special diseases. The technique of the different procedures is described in connection with the occasions on which they are applied, so that the student, instead of first learning the various forms of massage, gradually meets them as he reads through the book. This scheme has certain advantages, and probably will be found serviceable in practice. The book is written with good judgment, and with much more self-restraint, as regards the limitations of this form of treatment, than is often to be found in special treatises. It can be thoroughly recommended to students who wish to know something of massage without devoting special attention to this branch of medicine. The book is well illustrated throughout, and the descriptions of the various technical methods are clear and concise.

NEW EDITIONS.

Quain's Elements of Anatomy. Edited by E. A. SCHÄFER, JOHNSON SYMINGTON, and T. H. BRYCE. Eleventh Edition. Vol. II., Part II., Splanchnology. By J. SYMINGTON. Pp. x. + 392. With 349 Illustrations. London: Longmans, Green & Co. 1914. Price 10s. 6d. net.

THIS important volume of the latest edition of "Quain" deals with the topographical anatomy and the morphology of the digestive, respiratory, and genito-urinary systems, and of the ductless glands. It embodies a great amount of the recent work which has been carried out by Professor Symington himself, and in his laboratory by Dr. Crymble, dealing mainly with the abdominal cavity and its contents. Some of the excellent drawings prepared in Belfast by the late Professor J. S. Dickey have also been utilised. The energetic head of the Belfast School of Anatomy is to be warmly congratulated upon the work done by himself and his co-workers.

The results show not only increasing detail of description, but also, to a greater extent, the alterations in the description of the normal anatomy of various organs which have been rendered necessary by the new information gained by X-ray examination of the living, by careful examination and reconstruction of frozen sections, and by formalin preparations.

The B. N. A. terminology is used for the greater part, but the editor has not refrained from using the commonly accepted English names in cases where it has appeared advisable to do so.

The illustrations are excellent, and form in themselves a storehouse of anatomical information, for many of them are careful and beautiful drawings of frozen sections and of special dissections and preparations made by the editor, and the study of these alone will well repay the surgeon and practitioner as well as the student.

The price of the part is moderate, in view of the size of the volume and the number and quality of the illustrations.

Elements of Pharmacy, Materia Medica, and Therapeutics. By Sir WILLIAM WHITLA. Tenth Edition. Pp. 680. London: Baillière, Tindall & Cox. 1915. Price 9s. net.

THE present edition of this well-known work is in every way as satisfactory a treatise as its predecessors, not merely as a reliable text-book on the subject, but as a work of reference. It is singularly concise and complete in its information, and the easy style of the author makes for interesting reading. A book which has reached its tenth edition requires no additional recommendation; it has already assured its success.

Cunningham's Manual of Practical Anatomy. Vol. II. Edited by ARTHUR ROBINSON. Sixth Edition. Pp. xxx. + 621. With 278 Illustrations. London: Henry Frowde and Hodder & Stoughton. 1914. Price 10s. 6d. net.

THIS volume, which includes the thorax, head, and neck, completes the new edition of this standard work. The section on the brain has been rearranged and very largely rewritten, and many new illustrations have been added. A useful series of radiographs has been added. Eleven coloured plates are included among the illustrations. It is unnecessary to say anything in commendation of a work which is *facile princeps* of its class.

Syphilology and Venereal Disease. By C. F. MARSHALL, M.D., M.Sc., F.R.C.S.E. Third Edition. Pp. xxi. + 465. London: Baillière, Tindall & Cox. 1914. Price 10s. 6d.

THE fact that this work has reached a third edition is sufficient indication that it is excellent, and has already proved its usefulness. The amount of labour which the author must have devoted to its compilation is immense, as is shown by the full and complete list of references given at the end of each chapter, which will prove most useful to anyone who wishes to go more deeply into the subject.

Syphilis is first considered from its historical standpoint. A general view of the disease is then given, its pathology discussed, and

the latest methods of serum diagnosis described. The varieties as to form, situation, and modes of contracting the primary lesion are fully gone into, together with the differential diagnosis, and this is followed by a detailed account of syphilis as it affects the different systems of the body in its primary, secondary, tertiary, and parasymphilitic manifestations. The general treatment of the disease in all its stages is finally considered. Hereditary and congenital syphilis, their systematology and treatment, are gone into very fully.

While only four pages are given to chancreoid, to gonorrhœa and its treatment some eighty pages are devoted. The final chapter consists of a brief résumé of venereal disease in its relation to public health, marriage and life assurance being the subjects specially touched upon.

Taken as a whole, the book is excellent, but almost too much has been attempted. The details as to tests and reactions would not assist the specialist, while they only confuse the general practitioner.

The elaboration displayed in describing syphilis as it affects the systems tends to repetition, while the very detailed differential diagnosis of the disease in its nervous manifestations and the minute description of the systematology of heredo-syphilis tend to confusion, the definite conclusion one comes to being that in the opinion of the author whatever is doubtful may be, and probably is, syphilitic.

The reading of some of the chapters becomes a weariness to the flesh, and the information acquired is hardly commensurate to the labour involved in their perusal.

The chapters on treatment are too compendious, and the choice of different methods described leaves one with a very confused idea of what the author really considers to be the best.

The four pages on chancreoid are concise and to the point. Gonorrhœa and its complications are most fully gone into; but here, as in the chapter on syphilis, the subject is too much elaborated. So many opinions of various authorities are stated, and so many forms of treatment suggested, that definite conclusions are difficult to arrive at. The final chapter on venereal disease in relation to public health is excellent but somewhat diffuse. A variety of opinions as to the relationship of syphilis to life assurance is given, but little definite is stated. The paragraphs on syphilis and marriage are good.

Physiological Principles in Treatment. By W. LANGDON BROWN, M.D., F.R.C.P.(Lond.). Third Edition. Pp. viii. + 408. London: Baillière, Tindall & Cox. 1914. Price 5s. net.

IN these days, when physiology tends more and more to become a separate science, with a periodical literature and even a terminology of its own, the practitioner of medicine finds it hard to keep pace with the great advances that are being made, and to apply these to the problems of disease as he meets it at the bedside. In Dr. Langdon

Brown's small work he will find an epitome of all the most recent discoveries and advances in pure physiology, and an admirably clear exposition of their bearings on clinical medicine. Nothing could be more useful, for example, than the first chapter, in which the principles underlying the application of organo-therapy are discussed. After a brief but clear description of the general characters of "hormones," each of these bodies—iodothylin, adrenin, pituitrin, gastric secretin, and the others—is taken up separately, with special reference to their applications in treatment.

The following two chapters deal with the rational treatment of gastric and intestinal disorders and the mechanical factors in indigestion, and contain much that throws light on these much-discussed subjects. The author's views on the treatment of the various forms of dyspepsia, pyloric obstruction, intestinal stasis, and other gastrointestinal conditions appeal to us as being based on sound common sense, as well as sound physiology. The sections on the work of the pancreas, uric acid and the purin bodies, glycosuria and diabetes, intestinal intoxications and irregular action of the heart are specially interesting and instructive.

We can confidently recommend this work to practitioners who desire to base their therapeutics on sound physiological knowledge. To the senior student of medicine it should also prove of great value as a convenient means of correlating what he has learned from his teachers of physiology with what he sees in the wards of the hospital.

A Manual of Diseases of the Eye. By CHARLES MAY and CLAUD WORTH. Fourth Edition. Pp. viii. + 144. With 359 Illustrations. London: Baillière, Tindall & Cox. 1914. Price 10s. 6d. net.

THE third edition of this well-known book appeared in 1911. It has been carefully revised and brought thoroughly up to date, the principal addition being an interesting and clearly written chapter upon colour-blindness, contributed by Mr. C. Devereux Marshall. The authors aim at making their work useful as a text book for students and a practical manual for practitioners. They have succeeded in condensing a considerable amount of detail into a relatively small space, but very often, even in the descriptions of the more frequent diseases, clearness has been sacrificed to brevity. The illustrations, particularly the coloured plates of the fundus, are in the main excellent, although the anatomical diagrams present some inaccuracies. The chapter on vaccines is largely devoted to a description of the general technique of vaccine therapy. More might with advantage have been said of the effects of vaccines in actual ocular diseases.

A Manual of Minor Surgery and Bandaging. By H. MORRISTON DAVIES, M.D. Fifteenth Edition. Pp. 467. With 239 Illustrations. London: J. & A. Churchill. 1914. Price 7s. 6d. net.

THIS elementary work has proved useful to many generations of house-surgeons and students, and the care which has been bestowed on the preparation of the new edition now before us will ensure its continued usefulness. Not the least valuable section is the introductory chapter devoted to a consideration of the status of the house-surgeon. Various alterations have been made in the general scheme of the work, all of which are in the right direction. The illustrations are clear and simple. Many which depict ordinary surgical instruments might well be dispensed with, as might also the frontispiece. The subject-matter is excellent, and the work should find a place in every house-surgeon's room in hospital.

The Sale of Food and Drugs Acts, 1875 to 1907: with Notes and Cases. By the late Sir WILLIAM J. BELL, LL.D. Sixth Edition by CHARLES F. LLOYD and R. A. ROBINSON. Pp. xxxix. + 310. London: Butterworth & Co. 1914. Price 8s. 6d. net.

THAT this work has proved of value to lawyers, medical officers of health, analysts, and inspectors is shown by the fact that a sixth edition has just appeared. The chief additions in the present volume deal, of course, with recent legislation regarding milk and its derivatives. Thus the Milk and Dairies Act, 1914, and the Milk and Cream Regulations, 1912, receive very full treatment. The former Act has very greatly altered the law as to the obtaining of samples of milk and cream for analysis. There is no doubt but that a great gain to public health will result from the passing of this Act, and the sale of tuberculous milk or milk adulterated or unwholesome will be made very difficult. A most important feature in the volume is the inclusion of a number of circular letters from different Government departments on questions which have arisen under the Acts. The examples of various certificates which may be required will prove of the greatest value, as the loose way in which these are often stated gives rise to difficulties. The excellent summaries of the law cases which have been decided will prove of the greatest use to our legal colleagues.

Practical Sanitary Science: A Handbook for the Public Health Laboratory. By DAVID SOMMERVILLE, M.D., M.R.C.P., D.P.H. Second Edition. Pp. 320 + viii. 77 Illustrations. London: Baillière, Tindall & Cox. 1914. Price 10s. 6d. net.

WE have often wondered why a new edition of Dr. Sommerville's handbook had not appeared, because as a laboratory guide for students preparing for the D.P.H. examination it seemed to meet every require-

ment. Now, however, we have to welcome the new second edition, which bears evidence of careful revision. Many new methods of analysis have been introduced within the last ten years, and the author has made ample use of them. On the other hand, one is glad to see that many of the old methods have stood the test of time, and are still employed in routine analysis. A strong feature of the handbook is the care which the author has taken to explain the methods of analysis, and the numerous examples he gives make the steps of each process clear and easily understood. The work compares most favourably with other works written as laboratory guides, and we feel sure that it will be largely made use of and appreciated by those preparing for the degree in Public Health.

Quain's Elements of Anatomy. Edited by E. A. SCHÄFER, JOHNSON SYMINGTON, and T. H. BRYCE. Eleventh Edition. In Four Vols. Vol. IV., Part I, Osteology and Arthrology. By T. H. BRYCE. Pp. viii. + 329. With 275 Illustrations. London: Longmans, Green & Co. 1915. Price 12s. 6d. net.

In this issue of *Quain's Anatomy*—the eleventh edition—the sections on Osteology and Arthrology are combined in a single volume of convenient size, and in both sections the text has been thoroughly revised and in part rewritten; new sections on the development of the skeleton have been added and the paragraphs dealing with the variations of the bones expanded.

Two new and important additional changes at once attract attention; the first of these is the introduction of a series of beautiful and accurate coloured drawings of the joints, printed on special paper, which forms probably the finest series of joint illustrations published in any English text-book, if not in any one.

The second is the addition of an appendix in which is given a comprehensive list of recent literature on the various subjects discussed in the individual sections of the text, arranged alphabetically under the names of the different authors, in sections following the arrangement of the text, and giving also in full the references to the individual work quoted in the text.

Reference to the literature of any given subject is thus rendered simple, and the provision of an appendix of this kind forms a most valuable addition. It is especially welcome in a text-book widely used by students at all stages, for it will stimulate that reference to original authorities which is so valuable a habit to encourage among students, and it will, indirectly, stimulate the pursuit of original investigation into those numerous problems which are opened up in the study of the branch of human anatomy represented in this volume.

It is perhaps a pity that the traditional "anatomical" treatment of

the skeleton is limited so largely to the study of merely the dried bones of the body, and that the present volume does not at once begin by explaining fully the anatomy of living bones, which in themselves constitute complex organs built up of various kinds of tissues, with special problems of growth nutrition, and functions other than purely mechanical ones.

These questions are no doubt treated in other volumes of this text-book, but their inclusion at the beginning of the present volume would do much to direct the mind of the student into the proper attitude towards osteology, and help him to realise that the skeleton in the living body is a living thing, very different from the collection of macerated and dried specimens about which he hears so much.

A Manual of Surgical Anatomy. By CHARLES R. WHITTAKER, F.R.C.S., (Edin.), F.R.S.E. Second Edition. Pp. 343. Edinburgh: E. & S. Livingstone. 1914. Price 6s. net.

WE are glad to be able to speak favourably of this little work. It is concise, accurate, and sufficiently comprehensive for the purpose for which it is intended. Many of the diagrams are very helpful, and the author avoids the too common error of making one diagram illustrate too many points. It is, of course, possible to make a number of criticisms. For example, Figs. 3 and 14 are not very clear, and should be replaced in the next edition by larger ones. They are intended, obviously, to represent the *root* areas of the upper and lower extremities. The title of the heading above them—"Cutaneous Areas"—is puzzling to the junior student, particularly as no explanatory letterpress accompanies them. Alongside of them diagrams representing the areas of distribution of the ordinary peripheral nerves might also be inserted with advantage. The printing throughout the book is in large type—a point too often neglected in small, condensed books on surgical anatomy.

Diseases of the Nose, Throat, and Ear (Medical and Surgical). By WILLIAM LINCOLN BALLENGER, M.D. Fourth Edition. Pp. 1032. With 569 Illustrations. London: Henry Kimpton. 1914. Price 28s.

THE distinguishing feature of this new edition will be found in its chapters on the labyrinth, which incorporate the modern teaching of the Vienna school, and are profusely illustrated. The new matter on the labyrinth amounts to over one hundred pages. Among other new features may be mentioned a full description of Mosher's fronto-ethmoidal operation, an account of the use of vaccines in hay fever, and of Haynes' operation for lepto-meningitis. The sections on the intracranial complications of suppurative otitis media, notably those on meningitis and brain abscess, have been largely re-written and brought

up to date, as has also the section on salvarsan in the treatment of syphilis of the auditory nerve.

We are surprised to find that the section upon ozæna does not contain any reference to the work of Perez, who claims that he has discovered the causal organism of this disease.

In the preparation of this edition the author has received help from several distinguished American specialists. The work is profusely and well illustrated, and the fact that it has now reached a fourth edition speaks well for its popularity.

The Newer Physiology in Surgical and General Practice. By A. RENDALL SHORT, M.D., F.R.C.S. Third Edition. Pp. xi. + 256. Bristol: J. Wright & Sons, Ltd. 1914. Price 5s. net.

In the preface to this, the third, edition of his work, Mr. Rendall Short explains that the change of title from "The New Physiology" to "The Newer" has been made because "half the present volume is new." We scarcely see the necessity for the change. In a fresh issue of such a work we expect recent advances to be incorporated, and we look for not only the newer, but the newest. Nor are we disappointed because we find the first chapter devoted to a consideration of vitamins in relation to deficiency diseases, and the second to a summary of recent investigations on the various secretions of the genital glands.

The never-ending subject of surgical shock has been studied afresh, the various theories as to its causation analysed, and the resultant modifications in the measures to be taken to prevent or to relieve the condition, fully described, and so on through every chapter we find evidence of careful revision and amplification, and we can confidently reaffirm the very favourable opinion we have previously expressed of this little work.

General Bacteriology. By EDWIN O. JORDAN, Ph.D. Fourth Edition. Pp. 647. With 175 Illustrations. Philadelphia and London: W. B. Saunders Co. 1914. Price 13s. net.

It is sufficient evidence of the popularity and usefulness of Professor Jordan's book that since it first appeared in 1908 it has gone through four editions and has been revised and reprinted each year. In such a subject as bacteriology, which is continually and rapidly advancing, frequent revision and alteration of a text-book is necessary if it is to be of real use.

In this edition several important additions have been made, notably a new chapter on the filterable viruses, which gives an up-to-date and succinct account of the characters of these viruses, and the diseases associated with them, especially poliomyelitis. Additions have been made to the accounts of antityphoid inoculation, leprosy, sporotrichosis and trypanosomiasis.

That much of the text on the general facts of bacteriology and better-known organisms is the same as in previous editions shows how this work has stood the test of time. Not only organisms pathogenic to man are considered, but also those associated with some of the commoner diseases of plants.

Under each subject the more important references are given. The illustrations are numerous and on the whole good. The style of the book is lucid and pleasing, and it is a work that should find a place in the library of any worker at bacteriology.

The Child's Diet. By J. SADLER CURGENVEN, M.R.C.S., L.R.C.P.
Second Edition. Pp. viii. + 115. London: H. K. Lewis. 1914.
Price 2s. 6d. net.

THE author deals in a short and rather discursive manner with the feeding of infants and young children, emphasising the errors in dieting which lead to dyspepsia. He believes that much of the indigestion in children past the age of infancy is due to an excess of unmasticated starch in the stomach, and draws up a dietary in which the starch-rich foods are much reduced. The pap-foods (milk puddings, porridge) are almost totally cut out, and bread is to be given stale or toasted. There is a long appendix of most useful cooking recipes for the food of young children; this is not the least valuable part of the book.

Flies in Relation to Disease: Non-Blood-sucking Flies. By G. S. GRAHAM-SMITH. Second Edition. Pp. xvi. + 389. With 79 Illustrations. Cambridge: At the University Press. 1914. Price 12s. 6d. net.

THE first 263 pages of this book are a reprint of the first edition. Then follows an appendix of 87 pages bringing the subject up to date. In this the effect of larval conditions on adult flies, range of flight, change of habits, and other general aspects of the subject are dealt with. Coming to disease, further additions to our knowledge are duly noted, and there is a long section on the connection of flies with epidemic summer diarrhœa. The evidence is carefully worked out, and 14 charts show the relationship between diarrhœa mortality and meteorological conditions, and between these latter and the occurrence of flies. A correlation between the diarrhœa death curve and the activities of flies seems to be proved.

Manual of Histology and Organography. By CHARLES HILL, Ph.D., M.D. Third Edition. Revised. Pp. 483. London: W. B. Saunders Co. 1914. Price 10s. 6d. net.

THIS volume includes much macroscopic description usually left to the anatomist. In addition there is much information which is hardly

histological, e.g. on page 60 the causes of constipation are discussed and remedies suggested.

The quality of the various chapters differs widely. That on the teeth is excellent, and should be very useful to dental students. The chapters on the digestive organs and on the eye and ear contain in a condensed yet readable form a very good description of these organs, with numerous useful illustrations. On the other hand the section on voluntary muscle is hopelessly inaccurate, the structure of a fibre being confused with that of a sarcostyle or fibril. The diagram on page 92 is of a sarcostyle, and not of a fibre as stated. Again, in the section on nerve cells no mention is made of Nissl's bodies, and the fact that the "cytoplasm has a fibrillar structure" is all the information we are given about neurofibrils.

As a whole the book falls short of the requirements of the medical student.

A System of Clinical Medicine. By the late THOMAS DIXON SAVILL, M.D.(Lond.). Fourth Edition. Pp. xxviii. + 948. London: Edward Arnold. 1914. Price 25s. net.

THIS work is so widely known and so deservedly appreciated that the appearance of a new edition incorporating the results of the more recent methods of clinical investigation is very welcome.

As might be expected, the main alteration is in the section dealing with cardiac disease. It is sufficient to say that this has been very ably carried out, graphic methods being given their proper value without being unduly emphasised at the expense of the older and more readily applicable means of diagnosis. The other changes in this edition have been judiciously made and add to its value, while the essentially practical character of the original work has been carefully retained. Students and practitioners can rely upon finding in this book accurate and useful information in a readily accessible form.

NOTES ON BOOKS.

DR. JAMES B. HURRY shows considerable ingenuity in arranging the varied phenomena of neurasthenia in a series of vicious circles—*The Vicious Circles of Neurasthenia and their Treatment* (J. & A. Churchill, 1915, price 3s. 6d. net).

Dr. A. S. Woodwark's text-book entitled *Medical Nursing* (London, Edward Arnold, 1914, price 4s. 6d. net) will be welcomed by all those who are interested in the intellectual side of nursing. The book, which contains much that has never been included in any similar work, is concise, well arranged, and enriched by an excellent index. While

there are some small points, such as the preparation of opium and turpentine fomentations, and the application of a hot pack or a starch poultice, which might be open to criticism, the book as a whole is valuable, and especially useful to nurses will be the chapter on the administration and action of medicines, and the masterly exposition of tests and vaccines in the chapter on bacteriology.

TRANSACTIONS, REPORTS, ETC.—We have received the thirty-second volume of the *Archives of the Middlesex Hospital, Clinical Series*, No. xiv. (Macmillan & Co., Ltd.), which contains a number of useful papers on matters of present-day interest.

The ninth volume of *The Transactions of the American Association of Genito-Urinary Surgeons* is quite up to the high standard of its predecessors. The subjects dealt with range over the whole of the genito-urinary tract, and the value of the papers is enhanced by the full reports of discussions which are appended. The illustrations are excellent.

The Medical and Surgical Reports of the Episcopal Hospital, Philadelphia (vol. ii.), in addition to very full statistical tables of the work accomplished in the various departments of the Hospital, contains a number of important papers which have been read at various societies by members of the staff, as well as others which have been specially prepared for this volume. These are commendably short and practical, and are well illustrated. The section on orthopædics is worthy of special notice.

The annual volume of the *Transactions of the American Gynecological Society* for 1914 contains several articles of more than usual merit. Dr. Reuben Peterson writes a critical review, extending to sixty pages of print, on five hundred published and unpublished cases of abdominal Cæsarean section for eclampsia; apparently the maternal mortality following this operation when performed for eclampsia has fallen somewhat in the past five years, but operators will still do well to scrutinise very carefully all the records before they come to regard it as a justifiable means of treatment. Dr. John G. Clark makes a valuable contribution to the subject of surgical intervention in cholelithiasis; Dr. Edward A. Schumann has a thoughtful paper on the dynamics of the female pelvis; and Dr. Charles C. Norris deals in a masterly way with congenital and placental tuberculosis. The President, Professor Whitridge Williams, is outspoken in his criticism of the Society's work in the department of operative midwifery. He says: "Careful analysis of our *Transactions* has failed to convince me that scarcely a single fundamental contribution to practical obstetrics has been made to this Society."

BOOKS RECEIVED.

BARCLAY, A. E. The Alimentary Tract	(Sherratt & Hughes)	15s.
BERKELEY, C., and V. BONNEY. The Difficulties and Emergencies of Obstetric Practice. Second Edition	(J. & A. Churchill)	24s.
BREND, W. A. A Handbook of Medical Jurisprudence and Toxicology. Second Edition (C. Griffin & Co., Ltd.)		8s. 6d.
CABOT, R. C. Differential Diagnosis. Vol. II.	(W. B. Saunders Co.)	24s.
CHURCH, A., and F. PETERSON. Nervous and Mental Diseases	(W. B. Saunders Co.)	21s.
DONALD, A. An Introduction to Midwifery. Seventh Edition	(C. Griffin & Co., Ltd.)	5s.
FITZWILLIAMS, D. C. L. A Nursing Manual for Nurses and Nursing Orderlies (Frowde, Hardier & Stoughton)		6s.
GWATHMEY, J. T., and C. BASKERVILLE. Anæsthesia	(D. Appleton & Co.)	25s.
HOOPE, E. W. Text-Book of Public Health	(E. & S. Livingstone)	5s.
JOHNSTON, T. B. Medical Applied Anatomy	(A. & C. Black, Ltd.)	7s. 6d.
KNOX, R. Radiography, X-Ray Therapeutics, and Radium Therapy	(A. & C. Black, Ltd.)	25s.
KYLE, D. B. A Text-Book of Diseases of the Nose and Throat. Fifth Edition (W. B. Saunders Co.)		20s.
LEFTWICH, R. W. An Index of Symptoms with Diagnostic Methods. Fifth Edition (Smith, Elder & Co.)		—
MACDONALD, D. M. Husband's Students' Pocket Prescriber. Fifth Edition (E. & S. Livingstone)		1s. 6d.
MARTINDALE, W. H., and W. W. WESTCOTT. The Extra Pharmacopœia. Sixth Edition. Vol. I. (4s.), Vol. II. (7s.)	(H. K. Lewis)	21s.
MINCHIN, W. C. The Treatment, Prevention, and Cure of Tuberculosis and Lupus with Oleum Allii. Second Edition	(Baillière, Tindall & Cox)	5s.
MITCHELL, F. W. D. A Key to Health and Long Life	(W. W. Daniel, Ltd.)	3s. 6d.
MORTON, E. R. A Text-Book of Radiology	(H. Kimpton)	7s. 6d.
PRACTICAL Medicine Series, 1914. Vol. VII. Obstetrics (The Year-Book Publishers, Chicago)		dol. 1.35.
PRACTICAL Medicine Series, 1914. Vol. VIII. Materia Medica and Therapeutics; Preventive Medicine; Climatology	(The Year-Book Publishers, Chicago)	dol. 1.50.
PRACTICAL Medicine Series, 1914. Vol. X. Nervous and Mental Diseases (The Year-Book Publishers, Chicago)		dol. 1.35.
PRENTISS, C. W. A Laboratory Manual and Text-Book of Embryology (W. B. Saunders Co.)		17s.
SEQUEIRA, J. H. Diseases of the Skin. Second Edition	(J. & A. Churchill)	25s.
SMITH, F. J. Domestic Hygiene for Nurses. Second Edition	(J. & A. Churchill)	2s. 6d.
TAYLOR, W. W. The Chemistry of Colloids	(Edward Arnold)	7s. 6d.
TODD, A. H. A Practical Handbook of Surgical After-Treatment	(Edward Arnold)	4s. 6d.
TODD, J. C. Clinical Diagnosis—A Manual of Laboratory Methods. Third Edition (W. B. Saunders Co.)		—
VALLOW, H. The Inevitable Complement (The Care and After-Care of Consumptives) (Dale, Sons & Danielsson, Ltd.)		1s. 6d.
WHITE, W. HALE. Materia Medica. Fourteenth Edition	(J. & A. Churchill)	6s. 6d.
WILSON, W. J. Students' Text-Book of Hygiene	(Wm. Heinemann)	8s. 6d.

EDINBURGH

MEDICAL JOURNAL.

EDITORIAL NOTES.

The Army Medical Service.

IN a dispatch dated 5th April 1915 Field-Marshal Sir John French makes the following reference to the medical service of the Army :—

“Since the date of my last report the general health of the Army has been excellent; enteric has decreased, and there has been no recurrence on any appreciable scale of the ‘foot’ trouble which appeared so threatening in December and January.

“These results are due to the skill and energy which have characterised in a marked degree the work of the Royal Army Medical Corps throughout the campaign, under the able supervision of Surgeon-General T. J. O’Donnell, D.S.O., Deputy Director-General, Medical Services. But much credit is also due to Divisional, Brigade, Regimental, and Company Commanders for the close supervision which has been kept over the health of their men by seeing that the precautions laid down for the troops before entering and after leaving the trenches are duly observed, and by the establishment and efficient maintenance of bathing-places and wash-houses, and by the ingenious means universally employed throughout the Forces to maintain the cleanliness of the men, having regard both to their bodies and their clothing.

“I have inspected most of these houses and establishments, and consider them models of careful organisation and supervision.

“I would particularly comment upon the energy displayed by the Royal Army Medical Corps in the scientific efforts they have made to discover and check disease in its earliest stages by a system of experimental research, which I think has never before been so fully developed in the field.

“In this work they have been ably assisted by those distinguished members of the medical profession who are now employed as Military Medical Officers, and whose invaluable services I gratefully acknowledge.

“The actual strength of the Force in the field has been increased and the health of the troops improved by a system of ‘convalescent’ hospitals.

“In these establishments slight wounds and minor ailments are treated, and men requiring attention and rest are received.

“By these means efficient soldiers, whose services would otherwise be lost for a long time, are kept in the country, whilst a large number of men are given immediate relief and rest when they require it without removing them from the area of operations.

“This adds materially to the fighting efficiency of the Forces.

“The principal convalescent hospital is at St. Omer. It was started and organised by Colonel A. F. L. Bate, Army Medical Service, whose zeal, energy, and organising power have rendered it a model hospital of its kind, and this example has materially assisted in the efficient organisation of similar smaller establishments at every Divisional Headquarters.”

Special Graduation THE following were awarded the degrees of
Ceremonial. M.B., Ch.B.(Edin.):—

F. A. Anderson, J. J. Block, R. B. Boston, J. G. Dobson, D. S. Falconer, F. J. Ng-a-Fook, H. J. Foote, A. W. Forrest, H. C. Fox, E. Fullerton, E. G. M. Gilchrist, David Golding, H. A. Hewat, Eric Jamieson, A. C. Laing, J. Lawson, R. J. S. M'Dowall, I. C. Mackay, R. M'Kinlay, P. C. MacRae, J. W. Mathews, Isabel Mitchell, S. N. Mitra, R. F. T. Newbery, C. H. Newton, J. M'C. Orme, R. N. Phease, W. B. Postlethwaite, J. O. Reid, C. Resnekov, Muhammad Abdul Latheef Sayeed, J. C. Sinclair, B. P. Varma.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—

At the quarterly examinations of the above Board, held in Edinburgh in April, the following candidates passed the *first examination*:—Janet A. A. Song, William B. Stott, Rebecca Goodman, Muriel Keyes, Nathaniel B. Watson, and Andrew F. Brigmen.

The following passed the *second examination*:—Andrew I. Meek (with distinction), John B. W. Telford, Mohammed Talant, Patrick J. Murmane, Janie I. M'Birnie, Agnes E. Keen, and Alan H. B. Hudson.

The following passed the *third examination*:—Zachariah A. Green, Hucknall Torkard (with distinction), John A. Murray, John A. Tolmie, John F. Campbell, Frederick C. J. Mitchell, Iwan Davies, Ernest A. Hamilton, Martha H. Hoching, Phoebe Tripp, Frank Jones, and Paul Vertannes.

The following candidates, having passed the *final examination*, were admitted L.R.C.P.E., L.R.C.S.E., L.R.F.P.&S.G.:—Arthur Craig, Perth; William Leckie Conllie, East Lothian; Victor James Wilson, Liverpool; Bak Hin Ong, Malacca, Strait Settlements; and Alaru Ojo Claribigbe, Sierra Leone, West Africa.

CLINICAL STUDIES. III.—PANCREATIC INFANTILISM.

By BYROM BRAMWELL, M.D., F.R.C.P.E., LL.D., F.R.S.E., Consulting Physician, Royal Infirmary, Edinburgh; Physician, Chalmers Hospital, Edinburgh.

IN February 1902 and March 1904 I brought before the Medico-Chirurgical Society of Edinburgh a case of infantilism associated with chronic diarrhœa in which the condition was due to defective or arrested pancreatic secretion, and in which the diarrhœa was cured and the infantilism removed by the administration of pancreatic extract and by that means alone. I claimed that the condition—pancreatic infantilism as I termed it—is a distinct clinical entity—a disease which had not hitherto been recognised and described.

The characters of pancreatic infantilism are:—Arrested bodily and arrested sexual development; intelligence good, no mental defect; no deformity or structural defect of the bones; no visceral disease or derangement except chronic diarrhœa, flatulent distension of the abdomen, and defective or arrested pancreatic secretion. The defective or arrested pancreatic secretion is probably due to chronic pancreatitis. In some cases the condition (chronic diarrhœa and infantilism) is completely cured by the administration of pancreatic extract and by that treatment alone.

In this communication I propose to detail the after-history of that case and to refer to other cases which have been recorded since I directed attention to the condition. The disease appears to be extremely rare. Cases of arrested development associated with, and apparently due to, chronic diarrhœa are not very uncommon, but in most of these cases there is not, so far as our present information enables us to judge, defective pancreatic secretion.

The details of the case are as follows:—

CASE OF PANCREATIC INFANTILISM CURED BY THE ADMINISTRATION OF PANCREATIC EXTRACT.

Clinical History.—D. B., aged $18\frac{7}{12}$, came under my observation at the end of the year 1901. Although $18\frac{1}{2}$ years of age, he looked like a

boy aged 10 or 11 ; he was only 4 ft. 4 $\frac{1}{8}$ ins. in height, and he weighed only 4 st. 7 $\frac{1}{2}$ lbs. The bodily development had apparently been arrested at the age of 10.

He was perfectly formed ; the different parts of the body were all proportionate. Skiagrams showed that the epiphyseal lines—which should close between the sixteenth and eighteenth years (Gray)—were unclosed ; consequently the bones were capable of further growth. This was a good point for prognosis.

He was mentally bright and intelligent. He presented none of the physical or mental alterations suggestive of sporadic cretinism, he was not the subject of inherited syphilis, and there was no suspicion of rickets and no evidence of tubercle.

The sexual organs were infantile ; there were no pubic or axillary hairs. His voice was high-pitched and childlike in tone.

For nine years before he came under my observation he had been the subject of chronic diarrhoea ; the average number of stools, before the pancreatic treatment was commenced, was five or six in the twenty-four hours ; the motions were copious, liquid, and somewhat light in colour (yellowish-brown). The abdomen was somewhat swollen and tympanitic. The appetite was good. He suffered a good deal from abdominal pains—cramps as he termed them—apparently due to flatulence. The stomach appeared to be quite normal ; examination of the stomach contents after a test-meal showed that the normal digestive principles were present. The urine was free from sugar.

Family History.—His father, aged 53, was alive and well ; his mother died at the age of 37 of pleurisy. Two brothers were dead—one at the age of 22 of phthisis, one in infancy. Four brothers and three sisters were alive and well ; all were normal in size except the youngest, aged 9 years, who was undersized. This brother was admitted to the Edinburgh Royal Infirmary under my care seven months later (22nd April 1902). He was then 10 years of age, well formed, sharp mentally, but very small and light (3 ft. 10 ins. in height, and 3 st. 8 $\frac{1}{2}$ lbs. in weight). He had for some time suffered from diarrhoea—four motions on an average daily. After his admission to the Infirmary there was no diarrhoea and the stools were normal ; there was no defective pancreatic secretion. He was discharged a fortnight later (6th May 1902) quite well, having gained 1 $\frac{1}{2}$ lbs. in weight. He is now quite well, and of normal height (5 ft. 6 ins.).

Diagnosis.—After carefully studying the case I came to the conclusion that the diarrhoea was due to defective metabolism in the upper part of the gastro-intestinal tract, and I suggested that it was probably due to disease or defective action of the pancreas. I had

seen several cases in which diarrhoea, apparently similar in character, was due to pancreatic disease.

The pancreatic secretion was shown to be defective or completely absent by three separate methods of research (see footnote, p. 326). Consequently I came to the conclusion that the diarrhoea was due to defective



FIG. 1.—The case of pancreatic infantilism described in the text before treatment (December 1901); age, 18½; height, 4 ft. 4½ ins.; weight, 4 st. 7½ lbs.

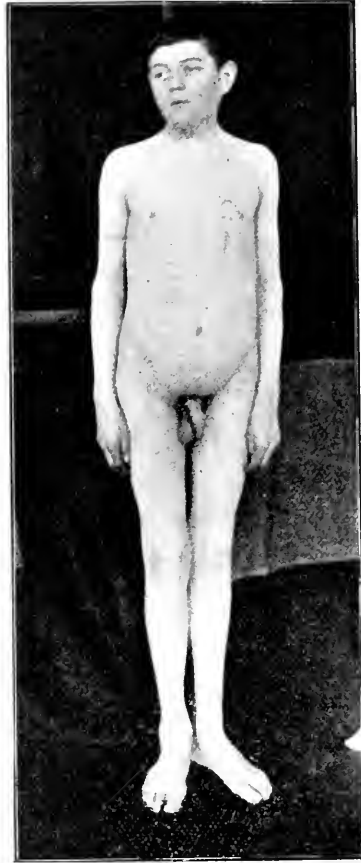


FIG. 2.—The case of pancreatic infantilism described in the text after treatment (May 1904); age, 21; height, 4 ft. 10 ins.; weight, 6 st. 3½ lbs.

or arrested action of the pancreas; and, as there was no other apparent cause for the arrested bodily and sexual development, I thought it probable that the infantilism, like the diarrhoea, was the result of defective or abolished pancreatic secretion. The correctness of this conclusion was proved by the results of treatment.

Treatment.—One drachm of pancreatic extract (Armour's liquor pancreaticus) and one drachm of a glycerine extract of steapsin, specially prepared in the laboratory of the Infirmary, three times daily, were prescribed. This, and for three months a milk diet, was the only treatment.

The treatment was commenced on 27th December 1901. During the years 1902, 1903, and 1904 the patient took the medicine regularly (except during the autumn of 1902), three times daily; during the years 1905 and 1906, twice daily. For the past eight years, 1907 to 1914 inclusive, he has been quite well and has not taken it at all.

An interesting point is that during the autumn of 1902 the patient omitted to take the pancreatic extract, that in consequence of this omission the diarrhœa returned, and that after the treatment was resumed the diarrhœa again disappeared.

After the first three months the milk diet was discontinued. For the past twelve years he has been having the ordinary diet used by persons in his position in life.

Condition on 6th March 1915.—The patient stated that for the past ten years he has enjoyed excellent health (with the exception of an attack of dyspepsia, due to errors in diet, during March and April 1914), and has been regularly at work as a tailor from 7 A.M. to 6.30 P.M., with one break of an hour. He is fortunate inasmuch as the workshop in which he is employed is an ideal place as regards sanitary arrangements. His present height is 5 ft. 3 ins., and his weight when stripped is 7 st. 13 lbs. During the past nine years his bowels have been very regular; he has, as a rule, one motion a day, seldom two; the motions are always formed and natural.*

* The pancreatic secretion was shown to be defective or completely absent by three separate methods of research, viz.:—

1. The stools contained a considerable quantity of undigested fat; this undigested fat became very much less after the administration of pancreatic extract.

2. When the patient was taking a milk diet the amount of phosphoric acid in the urine was greatly below the normal; after the administration of pancreatic extract the amount of phosphoric acid was markedly increased.

My house-physician, Dr. David Young, who suggested and conducted this part of the inquiry, stated that when a patient is having a milk diet, caseinogen is the source of phosphorus in the urine. This caseinogen is broken up in the stomach into paranucléin and a proteid. Paranucléin, which contains 4 per cent. of phosphorus, is insoluble; but when paranucléin comes in contact with the pancreatic juice, it is split into paranucléic acid and an albumose, which is soluble. This is the source of the phosphorus (phosphoric acid) in the urine.

Dr. Young found that the amount of phosphoric acid in the urine in this case, when the patient was taking a milk diet, was extremely small; but that

Results of the Treatment.—The result was remarkable improvement both as regards the diarrhoea, the bodily development and growth, and the sexual development.

1. Before the pancreatic treatment was commenced there were, on an average, 5 or 6 loose motions daily. As the result of the treatment the diarrhoea was arrested. During the first eighteen months after the treatment was commenced there were two motions on an average daily, one of which was formed; since that time there has been only one motion daily, formed and perfectly normal.

2. Before the treatment the patient had not grown at all for eight years. After the treatment he gradually commenced to grow. He now measures 5 ft. 3 ins., and weighs 7 st. 13 lbs., an increase of $10\frac{1}{2}$ inches in height and 3 st. $5\frac{1}{2}$ lbs. in weight.

3. The sexual development, which when the patient came under observation was quite infantile, gradually became complete.

4. The patient lost his child-like appearance; his voice, which was high-pitched and childish, became low-toned and rough.

The condition of the patient before treatment (December 1901) and after treatment (May 1904) is shown in Figs. 1 and 2, which are photographed exactly to scale.

during the administration of the pancreatic extract the amount of phosphoric acid in the urine underwent a very marked and rapid increase.

3. By Professor Sahli's test. This consists in the administration of capsules (invented by Professor Sahli of Berne) containing iodoform surrounded by a glutoid substance, which is insoluble in the gastric and intestinal secretions, but which is soluble in the pancreatic secretion. If the pancreatic secretion is active, the glutoid wall of the capsule is dissolved and the iodoform is set free; iodine, in the form of iodides and iodates, can then be demonstrated in the saliva by testing with chloroform and nitric acid; the nitric acid sets free the iodine, which gives a pink colour to the chloroform. The test is a beautiful means of demonstrating, *firstly*, the length of time that food (*i.e.* the capsule) remains in the stomach, and, *secondly*, whether the pancreatic secretion is active or not. If no iodine reaction is obtained in the saliva after the administration of the capsule, it may be concluded either that the capsule has not passed from the stomach, or that the pancreatic secretion is in abeyance.

In this case, after the administration of a test capsule, iodine could not be detected in the saliva. That the capsule had passed from the stomach was proved by the fact that it was found undigested in the stools. This experiment was repeated more than once. When, however, a test capsule was given along with food, and a dose (2 drachms) of pancreatic extract was given two hours afterwards, it was found that the saliva contained iodine an hour after the pancreatic extract had been administered. The activity of the capsules was also tested by a control experiment. Capsules were given to two patients who had no stomacic or intestinal disease; in both cases iodine was detected in the saliva an hour and a half after the capsules were swallowed.

These three methods of investigation showed that the pancreatic secretion was deficient or entirely absent.

The following table shows the differences in height and weight, etc., at different dates :—

TABLE SHOWING THE AGE, HEIGHT, WEIGHT, ETC., IN THE CASE OF PANCREATIC INFANTILISM DESCRIBED IN THE TEXT AT DIFFERENT DATES BEFORE AND AFTER TREATMENT.

Date.	Age.	Height.	Increase in Height.	Weight.	Increase in Weight.	Sexual Development.	Number of Motions <i>per Diem</i> .
Dec. 27, 1901 [*]	18 $\frac{7}{12}$	4 ft. 4 $\frac{1}{2}$ ins.	...	4 st. 7 $\frac{1}{2}$ lbs.	...	Infantile	4, 5, or 6
Feb. 2, 1902	18 $\frac{9}{12}$	4 " 4 $\frac{3}{4}$ "	1 in.	5 " 7 $\frac{1}{2}$ "	7 lbs.	"	2 or 3
Oct. 22, 1902 [†]	19 $\frac{3}{12}$	4 " 6 " "	1 $\frac{1}{2}$ ins.	5 " 7 " "	8 $\frac{1}{2}$ "	"	3, 4, or 5
May 20, 1903	20	4 " 8 $\frac{1}{2}$ "	4 $\frac{3}{4}$ "	5 " 7 " "	13 $\frac{1}{2}$ "	Commencing	2 (1 formed)
Mar. 2, 1904	20 $\frac{10}{12}$	4 " 9 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	6 " 11 $\frac{1}{2}$ "	22 "	Considerably developed	2 (1 formed)
May 10, 1904	21	4 " 10 " "	5 $\frac{1}{2}$ "	6 " 3 $\frac{1}{4}$ "	23 $\frac{3}{4}$ "	"	2 (1 formed)
Jan. 26, 1906	22 $\frac{8}{12}$	5 " 1 $\frac{1}{2}$ "	9 $\frac{3}{4}$ "	7 " 5 $\frac{3}{4}$ "	40 $\frac{1}{4}$ "	Complete	1 (formed)
June 12, 1908	25 $\frac{1}{12}$	5 " 2 $\frac{1}{4}$ "	10 $\frac{1}{2}$ "	7 " 11 $\frac{1}{2}$ "	46 "	"	1 (formed)
Mar. 6, 1915	31 $\frac{6}{12}$	5 " 3 " "	10 $\frac{1}{2}$ "	7 " 13 " "	47 $\frac{1}{2}$ "	"	1 (formed)

* Treatment commenced at this date.

† For the past two months has omitted to take the pancreatic extract.

NOTES OF OTHER CASES OF PANCREATIC INFANTILISM.

DR. J. L. RENTOUL'S CASE OF "PANCREATIC INFANTILISM"
(*Brit. Med. Journ.*, 24th December 1904, p. 1695).

R. K., female, aged 18, came under observation in May 1904. She looked quite childish—about 9 years of age. Her height was 4 ft. 2 $\frac{1}{4}$ ins., and her weight 4 st. $\frac{1}{2}$ lb. There was no sexual development; the breasts were represented by small nipples; there was no hair on the pubes nor in the axillæ. She had never menstruated. She was bright in appearance and intellect. Her appetite was good, but she never thrived. She was always considered a pretty child, and was well formed, save for enlargement of the abdomen. She had grown steadily till about the age of 11; after that age she had not grown at all.

The only abnormality detected was enlargement of the abdomen, due entirely to flatus. Since infancy she had been troubled with diarrhœa; the motions averaged 9 *per diem*; the stools were frothy and oily in character, and very large. The skin was healthy looking. Her bones and joints were quite healthy, and showed no evidence of rickets. The urine was normal.

Family History.—Father living and healthy; all his people are healthy. Mother died of "galloping consumption"; had one mis-

carriage and two full-term children, of which one is the patient; the other, a boy, is well-grown, and enjoys good health.

Diagnosis.—Infantilism with a pancreatic lesion.

Treatment.—Pancreatic extract, ten grains, three times daily.

Result.—In two weeks there was great improvement; the diarrhoea had ceased, the stools were healthy and more natural looking, the abdomen was not swollen. At the end of a month she had gained three-quarters of an inch in height and two and a half pounds in weight. The medicine (pancreatic extract) was now stopped for two weeks; at the end of that time she had gone back to her original condition, and lost half a pound in weight. The pancreatic extract was again given, but in the liquid form. In the course of four months she gained 2 inches in height and 9½ lbs. in weight. This improvement was gratifying, but more so was the improvement in her general condition—the breasts were now developing and are a fair size; hair had started to grow on the pubes and in the axillæ; she was bright, happy, and willing for work.

On 8th March 1915 Dr. Rentoul wrote me: “R. K. is now quite well; she has remained so since 1905. In 1906 I put her on to the pancreatic extract again for one month. She is working every day, menstruates regularly, and is in all respects in good health. Height, 4 ft. 6 ins.; weight, 6 st. 8 lbs.”

The following table shows the alterations in height and weight at at different dates:—

Date.	Height.	Weight.
16th May 1902. (Medicine)	4 ft. 2¼ ins.	4 st. ½ lb.
17th June „	4 „ 3 „	4 „ 3 lbs.
4th July „	4 „ 3 „	4 „ 2½ „
4th Aug. „ (Medicine)	4 „ 3¼ „	4 „ 8 „
12th Sept. „	4 „ 3¾ „	4 „ 8½ „
4th Oct. „	4 „ 4¼ „	4 „ 10 „
8th March 1915.	4 „ 6 „	6 „ 8 „

† No medicine between these dates.

DR. JOHN THOMSON'S CASE OF “PANCREATIC INFANTILISM” (*Transactions of the Medico-Chirurgical Society of Edinburgh*, 1904, vol. xxiii. p. 165).

T. R., aged 24½; height, 5 ft. 1½ ins.—that of a boy of 9 or 10. He was very intelligent, having passed the sixth standard at school when 13 years old. His hands and feet were slender and well formed, the genital organs infantile in appearance. He looked exactly the same as Dr. Bramwell's case had done two years ago before treatment with pancreas. He had the same yellowish pallor of complexion, the same

proportions of body, the same weak muscles and tumid abdomen, the same high-pitched childish voice.

He was the sixth child of healthy, well-conditioned parents, and had been regarded as healthy until about $11\frac{1}{2}$ years ago (October 1892), when he had a very severe attack of "influenza." After this he suffered from very intractable diarrhoea. The motions were numerous (4 to 7 in the day), pale, and extremely offensive, and often contained fat. There was great abdominal distension, sickness, loss of appetite, and frequent severe pains. In the earlier years of his illness he was an in-patient in the Children's Hospital and in the Royal Infirmary. In both he was regarded as a case of pancreatic disease. No treatment tried had any permanent effect on his symptoms, and when first seen by Dr. Thomson in November 1894 there had been little, if any, improvement. Dr. Sloan and Dr. Thomson tried a variety of treatment—acids, alkalies, sedatives, antiseptics, and arsenic. He was also given thyroid and pancreas, but not regularly, nor for a long time. Between the ages of 15 and $17\frac{1}{2}$ he grew $2\frac{1}{2}$ inches. During the next 5 years he gained 3 inches in height. During the last two years he had grown a quarter of an inch. The severe diarrhoea had ceased for two or three years, but the motions were still very unhealthy in character, abdominal pains were frequent, and the belly much distended. As the patient would not in recent years submit to hospital treatment, it had not been possible to investigate his case thoroughly. A skiagram showed that the epiphyses were in the state of development of those of a boy of 7 or 9 years old.

Subsequent Progress of the Case.—Dr. John Thomson has kindly given me the following report regarding the future progress of this case:—"Between April 1904 and March 1905, while under my observation, T. R. gained $1\frac{1}{2}$ inches in height but he lost none of his infantile characteristics. He had, as you will remember, an extreme dislike to all medical examination, and I lost sight of him for years.

"On 17th April 1913 (when he was $32\frac{1}{2}$ years old) I was asked to see him again in consultation. I was told that he had remained about the same off and on till six months before, when he began to complain of increasing debility, with abdominal pain and occasional foetid diarrhoea. One month before I saw him he was found by his medical man extremely emaciated and feeble, with no appetite, and his voice almost inaudible. The urine contained a considerable amount of sugar.

"I found him in a state of great exhaustion and much emaciated. His heart and lung sounds were normal. The abdomen was somewhat distended and showed some greatly enlarged veins on the surface. A hard swelling was present in the neighbourhood of the pancreas; its exact size and form could not be made out, owing to the tense con-

dition of the recti, although there was no complaint of tenderness on pressure. There was much sugar in the urine. His conformation was just as infantile as when you saw him. As he was much too weak to stand, I was not able to measure his height. His mother said she thought he had grown another inch since I had seen him in 1905. He went steadily downhill, and died on 25th May 1913. Before he died the abdominal tumour became more prominent to the right of the middle line.

“We diagnosed malignant tumour of the pancreas. Permission for a post-mortem examination was refused.”

Note by B. B.—Curiously enough this patient was a great friend of my patient (D. B.), who informs me that notwithstanding the remarkable improvement which occurred in his (D. B.’s) case, T. R. absolutely refused to be admitted to the Royal Infirmary, and would not take the medicine (pancreatic extract) prescribed by Dr. John Thomson, except very irregularly.

Dr. Conrad de L. Carey’s Case.—The following case, for which I am indebted to Dr. Conrad de L. Carey of Guernsey, is suggestive and interesting in connection with disease of the pancreas and infantilism :—

“Having recently read a lecture on ‘Infantilism’ in vol. i. of your *Clinical Studies*, I thought that an account of the following case might interest you :—

“A few days ago a girl was found lying in the road dead, and I was ordered by the Court to make an autopsy. In appearance the body was that of a girl about fourteen years old. There was no sign of any pubic hair, though at the inquest the birth certificate was produced, proving her to have been twenty years of age. The top of the scalp was quite bald, but there was no other evidence of syphilis, and there was certainly no cretinism about the case. *Post mortem* it was found that death was due to dilatation of the right ventricle, secondary to advanced endocarditis of the mitral valve. The uterus was about one inch in length—not more; no ovaries could be found. The kidneys were fused together at their bases, forming a single horse-shoe-shaped organ. The bowels were extremely small with thickened muscle coats, otherwise healthy.

“There was no sign of tubercle, but the pancreas was large and extremely hard, cutting just like fibrous tissue.

“I have been unable to get a history of any illness from the parents, which can be accounted for by their desire to shield themselves from any responsibility for not having called in a doctor. In view of your suggestion in the *Clinical Studies* that in such cases the pancreas was at fault, I thought that the account might interest you. It was stated at the inquest that the girl was quite bright and intelligent, though

she would not play with other children, and was extremely sensitive about her baldness.

"I take it that the condition of the pancreas was one of chronic pancreatitis, though one is at a loss for a cause. The teeth showed no signs of being peg-shaped; the corneæ were clear, palatæ normal; and tibiæ and other bones quite normal and well formed."

DR. R. G. FREEMAN'S CASE OF "INFANTILISM TREATED WITH PANCREATIC EXTRACT" (*American Journal of Diseases of Children*, November 1911, vol. ii. pp. 332-339).

Dr. R. G. Freeman of New York reported four cases of arrested development associated with chronic diarrhœa, in one of which (No. I.) marked improvement resulted from the use of pancreatic extract. Dr. Freeman wrote me on 31st March 1915, saying that another case (No. IV.) "was put on pancreatic extract, but no marked improvement took place in this child until she was taken to Dr. Combe at Lausanne, where, without very much modification in her treatment and with no medicine, she made a marked improvement during one summer."

"CASE I.—The first case, a child now $4\frac{1}{2}$ years old, has been under my care for twenty months. She had a history of never having done well. She had had repeated attacks of bowel trouble, from which she would convalesce, only to be debilitated by a fresh attack. When first seen in August 1909 she was suffering from intense general lassitude, and would not willingly lift her head from the pillow. She would lie for hours without moving or speaking. Her mental development was very good.

"Her tongue was heavily coated; her abdomen was distended; she was markedly emaciated and somewhat anæmic. She was having one or two very large, soft, grey, curdy movements. Her appetite was very poor. She was put on a diet of peptonised milk with wheat flour gruel after an initial dose of castor oil. Bismuth was administered at each feeding.

"The examinations of the fæces and urine were made by Dr. Herter and corresponded to the findings in his cases.

"During twenty months she showed practically no gain in weight, although at the time of the present report she weighed 2 pounds more than she did three months previously.

"No food had been found that appeared to increase her weight, although the gelatin advised by Dr. Herter was tried. The character of her stools improved, the greatest improvement having followed the administration of buttermilk, of which she took a pint a day. The stools became of good colour, slightly curdy, and but one of moderate size each day.

“The administration of intestinal antiseptics had no influence on the bacteria of the intestines. *Under the administration of pancreatic extract she seemed to improve more than under other medication.*”

On 31st March 1915 Dr. Freeman wrote me saying:—“Case No. I. was put on pancreatic extract, and has been on it most of the time. She improved very much as soon as the pancreatic extract was started. It was first given about five years ago; at that time she weighed 17 lbs.; last autumn, when she was eight years old, she weighed 35½ lbs. and measured 41½ ins.”

DR. A. A. MUMFORD'S CASES OF “ARRESTED GROWTH AND CHRONIC DIARRHŒA” (*Manchester Medical Chronicle*, June 1908).

Dr. A. A. Mumford has recorded some cases in children in which protracted ill-health, severe anæmia, and defective growth were associated with a faulty metabolism of fat. The stools were copious, frequent, and loose, evil-smelling, and clay-coloured or very light brown. There was occasionally a small trace of glycosuria, but no jaundice. The abdomen was distended; general nutrition was often so seriously impaired that growth was not only materially interfered with but absolutely arrested, so that a state of infantilism resulted, extending over many years. When once the assimilation of fat is secured and the accompanying catarrh diminished or cured, the symptoms may entirely pass off, and in some of the cases which he had been able to follow after a prolonged course of special treatment the disease was arrested, and the ordinary physiological processes were found sufficient to maintain the health of the child. A diagnosis of chronic interstitial pancreatitis was suggested.

In *Case I.* various forms of pancreatic extract were tried. The best results were obtained by small pilules, each containing one grain of pancreatin, two after each meal. Within a few days a change was brought about; the motions became less frequent in number, firmer in consistency, and of a normal colour; the general appearance of the child completely altered; the patient became lively, bright, and energetic; the pains in the joints entirely disappeared; the muscles of the legs began to fill out; the abdomen lost its swollen condition. The increase in weight, which was at first very slow, afterwards became marked.

In July 1905 the weight was 28¼ lbs.; September 1905, 25¾ lbs.; December 1905, 30 lbs.; March 1906, 31 lbs.; normal weight would be 43 lbs. Pancreatic treatment was then begun. By September 1906, the weight had increased to 34 lbs.; February 1907, 36½ lbs.; July 1907, 39¼ lbs.; March 1908, 43½ lbs.; normal, 52 lbs. Before pancreatic treatment the child was only 70 per cent. of its normal weight. After 18 months' treatment it had grown to 83 per cent. of the normal weight.

March 1915.—Dr. Mumford tells me that the child is in good health, fully grown, though spare; all the symptoms have disappeared.

I append the notes of two cases of infantilism associated with diarrhœa. At first sight they were thought to be cases of pancreatic infantilism, but this was not so. These cases seem similar to some cases described by Dr. Christian A. Herter at the annual meeting of the Association of American Physicians, under the term "*intestinal*" infantilism. A more appropriate term would, I think, be "*gastro-intestinal*" infantilism, for in Case II., related below, the defect seems to have been chiefly in the stomach.

CASE I.—*Infantilism with Chronic Diarrhœa and Anæmia*.—The patient (J. M'L.), a boy of 18, did not look more than 9 years of age. He was only 4 ft. $2\frac{6}{8}$ ins. in height and 4 st. $10\frac{1}{4}$ lbs. in weight. He stated that he had not grown since he was 8 years of age. His sexual organs were completely undeveloped. Mentally he was quite bright and sharp. He was employed on a farm, and was able to partly keep himself. His face was broad, full, and puffy-looking; his abdomen large, skin somewhat dry, but there were no symptoms of sporadic cretinism; he did not feel the cold; he sweated naturally on exertion; his hair was luxuriant and natural in texture. There was no umbilical hernia; the anterior fontanelle was closed; and, as already stated, he was mentally quite active and bright.

When he came into hospital he was markedly anæmic, and the spleen was somewhat enlarged; its lower edge could be distinctly felt in the abdomen. The anæmia was of the chlorotic type; the red corpuscles numbered 4,000,000 per cubic millimetre, and the hæmoglobin equalled 28 per cent.; the colour index (corrected) was therefore 0.38; the white corpuscles numbered 3200 per cubic millimetre; a differential count showed that the different forms of white corpuscles were present in normal proportions.

For the past eight years he had been troubled at intervals, about six times every year, with diarrhœa. The attacks of diarrhœa came on without obvious cause, and usually lasted for four, five, or six days. During the attacks he had six or seven copious light-coloured motions, mixed with slime, in the course of the twenty-four hours. Dr. John Thomson, who kindly sent the patient into the Infirmary under my care, thought that this was perhaps another case of pancreatic infantilism. But observation showed that this was not so.

As the result of treatment—milk diet and the administration of large doses of iron, in the form of Robertson's Bland's pill capsules—the bowels became quite regular, and the anæmia disappeared. On 24th May the red corpuscles numbered 4,500,000 per cubic millimetre,

and the haemoglobin equalled 65 per cent. But notwithstanding the disappearance of the diarrhoea and the anaemia, the patient did not grow while he was under observation in the Infirmary (he was discharged on 20th May 1904). This was no doubt due to want of time, for during the next two years this patient, who had not grown for ten years, increased five inches in height.

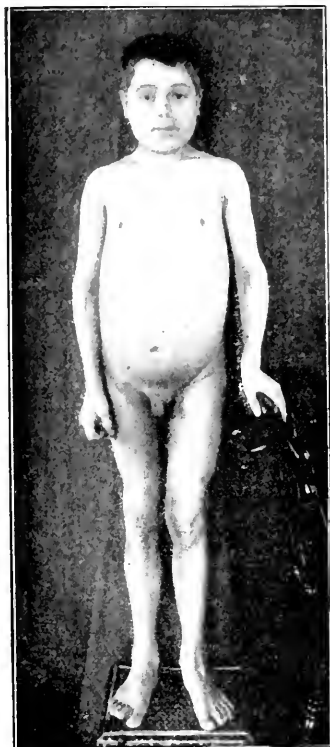


FIG. 3.—The case of infantilism with chronic diarrhoea, anaemia, and some enlargement of the spleen described in the text; age, 18; height, 4 ft. 2½ ins.; weight, 4 st. 10½ lbs.

The condition of the patient when he came under observation is seen in Fig. 3.

On 6th March 1906 the patient wrote my house-physician as follows:—"I may say I am pretty well, only I have very sore legs: I think it is rheumatics that is causing the trouble. I am growing in-kneed. Well, doctor, I may let you know that I have grown *five inches* since I left the Infirmary, and I am so glad to let you know, and also glad that Dr. Byrom Bramwell did so much good. I would be so much pleased if Dr. Bramwell could give me a remedy for my legs, they are so sore."

CASE II.—*Infantilism with Chronic Diarrhoea, Dilatation of the Stomach, Recurring Attacks of Severe Gastric Tetany, Absence of Free Hydrochloric Acid in the Stomach Contents; Cured by Diet, Hydrochloric Acid, Pepsin, Massage, Faradic Stimulation of the Dilated Stomach, etc.*—A. J., aged 20, was admitted to the Edinburgh Royal Infirmary on 1st November 1904. Though 20 years of age, he looked like a boy of 10



FIG. 4.—The case of gastro-intestinal infantilism described in the text before treatment; age, 20; height, 4 ft. 3½ ins.; weight, 4 st. 12½ lbs.

or 11. His height was 4 ft. 3½ ins., and his weight 4 st. 12½ lbs. His face looked much older than his body. His mental condition was in no way affected; he was, in fact, extremely sharp and intelligent. His body was perfectly formed except that his abdomen was large. His sexual organs were completely undeveloped (see Fig. 4).

The motions, which numbered on an average 4 *per diem*, were copious, frothy, like pea-soup, and contained a large excess of fat.

Analysis of the stomach contents showed an entire absence of free hydrochloric acid. The stomach was markedly dilated. Analysis of the stomach contents by Dr. Noël Paton gave the following result:—“Acid, a trace; total acidity, 0·01825; free acid, none; free HCl, none; butyric and lactic acids, none.”

The condition of the teeth was peculiar and interesting. In the lower jaw the central incisors were extremely long, owing to the fact



FIG. 5.—The case of gastro-intestinal infantilism described in the text, showing the condition of the gums and teeth.

that the gums had receded from the teeth—the sort of thing that one sees in old people* (see Fig. 5).

* Mr. Guy, Dental Surgeon to the Royal Infirmary, kindly examined the patient and gave me the following full report regarding the condition of the teeth:—“The teeth are well developed; there is no departure from the typical in form; all have erupted except the wisdom teeth. They are fairly regular, but the lower canines are slightly rotated, so that their labial surfaces are labio-distal, and the right upper canine is slightly inside the arch.

“The first lower molar, left, is missing; it was extracted three years ago.

“The first upper incisor, right, has a pit on the labial surface of the enamel.

“As regards caries—

“1st lower molar, right, has a small cavity on the occlusal surface.

“2nd lower molar, right, has a cavity on the occlusal, also one on the buccal surface.

“2nd upper molar, right, has a small cavity on the occlusal surface.

“1st upper premolar, right, has a mesial cavity.

History.—Thirteen years ago he had what he says was an attack of Asiatic cholera; up to that time he was quite well. For the past 10 years he had suffered from chronic diarrhoea, and had not grown at all; during this time he had had several attacks of pain and spasm in the abdomen, hands, feet, and limbs (typical gastric tetany). He had been under treatment in various hospitals without any effect.

Diagnosis.—At first sight this case looked exactly like my previous case of pancreatic infantilism, but observation showed that this was not so, though the motions contained an excess of fat, the pancreatic secretion, as tested by Sahli's capsules, was found to be quite active, and the long administration of pancreatic extract did not produce any benefit.

Treatment.—Milk diet, hydrochloric acid and pepsin, massage, faradic current to the stomach.

Result of Treatment.—Under this treatment the diarrhoea was markedly improved, and the patient gained in weight. He was discharged from the Infirmary on 27th March 1905.

On 4th October 1907 and 11th April 1908 he was readmitted suffering from severe attacks of gastric tetany—cramps in the stomach, hands, and feet.

His general condition had markedly improved. His height was now 4 ft. 6½ ins. and his weight 5 st. 2 lbs. The sexual organs, which, when first seen, were completely infantile, were now developing; pubic hair was beginning to grow.

Since his discharge from the Infirmary in March 1905 he had been employed as a laboratory assistant. During this time he had had frequent attacks of gastric tetany, but not severe enough to keep him from his work until the attack in October 1907 commenced.

The tetany was treated with chloral hydrate and bromide of potassium, thyroid extract, quinine, gastric lavage, massage, and the faradic current to the abdomen. The question of gastro-enterostomy was on several occasions carefully considered, but negatived.

He complained of great weakness in the knees and back. He

“In the upper jaw from the first premolar right to the first premolar left, inclusive, there is present chronic suppurative periodontitis (pyorrhœa alveolaris), the two central incisors the worst, with patulous sockets; all four incisors are loose and partly extruded.

“In the lower jaw from canine to canine inclusive, the same condition is present; the roots of the incisors are exposed, the centrals for half an inch, the laterals for a quarter of an inch; all four incisors are thickly coated on the lingual aspect with tartar, which is also present on the labial surface of the exposed roots; they are very loose.

“There is a patch of leukoplakia on the dorsum of the tongue.

“The teeth are to be carefully scaled and cleaned, and the pyorrhœa treated; the cavities of decay are to be filled.”

found great advantage from elastic knee-caps, together with arsenic, strychnine, and phosphoric acid.

Subsequent Progress of the Case.—After his discharge from the Infirmary in May 1908 he continued to enjoy good health, and has since been regularly employed as a laboratory assistant.

Remarks.—This is a most interesting case, not only because of the infantilism and its removal by gastric treatment, but because of the long-continued and very severe attacks of gastric tetany—a condition which is so often fatal.

THE NEW PSYCHIATRY.*

By W. H. B. STODDART, M.D., F.R.C.P.(London).

LECTURE II.

PSYCHO-ANALYSIS.

IN to-day's lecture I hope to give a description of psycho-analysis, its aims, objects, uses and technique.

Psycho-analysis is a method of obtaining a complete history of the patient's illness and an insight into his modes of thought, such as can be obtained in no other way. A detailed history of a mental disorder includes an account, not only of the manifest disturbances of conduct, but also of the patient's thoughts in association therewith, and of the various experiences and events which led up to it, together with their bearings on one another from the patient's point of view.

When all this has been ascertained it becomes necessary to trace the patient's particular habits of thought back to their origin. Psycho-analysis achieves this result by reviving his memory for numerous incidents and events which he had forgotten, and by unearthing his hidden, repressed, and therefore unconscious complexes, such as were considered in the first lecture, especially those having relationship with his present illness.

The true relationship is then discussed in such a way as to place these complexes in their true light. This is in reality a kind of re-education whereby the patient acquires self-realisation and develops his character and personality.

When all this is accomplished, the recovery of the patient, which is the chief aim of psycho-analysis, results as a matter of course.

* The Morison Lectures, delivered in the Royal College of Physicians, Stn, 10th, and 12th March 1915. (Abridged.)

So far I have constantly referred to "the patient," but it must be understood that psycho-analysis can be practised with benefit upon a normal individual. It is, in fact, desirable and a duty for every physician who contemplates using the method either to be psycho-analysed or to psycho-analyse himself, so that he shall not read his own complexes into his patients, shall come to his work, so to speak, with clean hands, gain a knowledge of himself such as cannot be obtained in any other way, and obtain that unity with himself which will give him self-confidence.

I might here mention that part of the mental equipment of a successful psycho-analyst consists of a knowledge of ancient mythology. Psycho-analysis of the many beautiful stories of the ancients gives him a thorough knowledge of the development of human thought. A study of the symbols of the Church and of the Egyptians, Indians, and Chinese, of the totemism of the North American Indians, and the superstitions of uneducated people, is also helpful; for they all throw light upon the history of the development of the human mind. In each one of us our mental development is to be regarded as a recapitulation of the mental development of the human race, just as the development of the embryo is a recapitulation of the anatomical development of man.

I ought to say at once that psycho-analysis is not easy, even for those who have far greater experience of the method than I have, and it takes a very great deal of time. It is customary to spend with each patient an hour a day six times a week. It then takes a fortnight to obtain a complete history and a clear insight into the nature of the case, and at least three months to accomplish a cure. Most cases take longer than this, and even Freud himself, purposely selecting very difficult cases, has spent as long as three years over a single patient before he effected recovery. It is satisfactory to note that a partial analysis is often beneficial, and we are constantly endeavouring to discover "short cuts," but even then we are bound to acknowledge the difficulty that psycho-analysis is expensive. It is not more so, however, than many surgical operations, and the gratitude expressed by patients is sufficient testimony that all this time and expense are well worth while.

I now come to the question, "What patients are suitable for psycho-analysis?"

As I have already said, psycho-analysis requires intelligent co-operation of the patient. It follows, therefore, that the patient

must be intelligent. He must have some pretence to education, and I do not recommend the employment of this method with the labouring classes, although successful analyses have been reported. Similarly it is not wise for a beginner to attempt the analysis of young children, as it requires very special tact.

It also follows that the patient must be willing to co-operate. You cannot analyse a patient who does not wish it. It is true that it is quite possible to learn much about his complexes by conversation and critical observation, but you will be unable to reveal them satisfactorily to himself. Then there is the type of patient who proclaims that he is perfectly willing to be analysed, but, when the work has well begun, he does not take it seriously, and plays his part in a desultory way. Such patients flit from one doctor to another, always dissatisfied with the last, and expect to be cured without making any effort themselves. All such patients should be left severely alone.

Lastly it is practically useless to attempt psycho-analysis on a patient who has passed middle age. At best, the analysis of a person who has passed his fiftieth year is sure to be lengthy.

In order to render clear what classes of mental disorder are suitable for analysis, let me first explain how I classify them.

I. The neuroses—neurasthenia ; the anxiety neurosis ; some forms of hypochondriasis. II. The psycho-neuroses—hysteria ; the compulsion neurosis (obsessions ; compulsions and some morbid fears). III. The psychoses—maniacal depressive insanity ; dementia præcox ; paranoia. IV. Confusional insanities (synaptic rebuff) ; exhaustion insanities ; infection insanities, including febrile and post-febrile delirium ; toxic insanities. V. Thyroigenous insanities. VI. Epileptic insanities. VII. Organic insanities. VIII. Chronic cortical atrophy. IX. Congenital mental defect (amentia).

Let us consider these in the reverse order. Cases of congenital mental defect cannot be psycho-analysed because there is insufficient intelligence for co-operation. Besides, no benefit could result from the analysis of such cases.

Patients who are suffering from organic cerebral changes and fall within the groups VII. and VIII. are unsuited to psycho-analysis, because the method cannot cure such diseases.

Of epilepsy there appear to be two varieties—one of toxic origin (probably the most common variety of idiopathic epilepsy) and the other of psychological origin. The differentiation between these can be made by enquiry into the history, when it will be found that in the toxic variety the convulsions are of more or less

regular recurrence, and are not traceable to any immediate exciting cause ; while in the psychogenic variety the convulsions are usually induced by some mental shock or incident of psychical importance. In the former variety mental therapeutics can accomplish nothing, but much is to be expected from psycho-analysis of the psychogenic cases. Indeed, several cases of cure by this method have been reported, and it is probable that those epileptics recorded as having been cured by hypnotism were also cases of psychogenic epilepsy.

Thyroigenous insanities are, of course, best treated with appropriate medicines.

In the fourth group mental confusion is so profound that psycho-analysis is impossible. You will observe that the alcoholic insanities fall within this group, but I must direct your attention to the fact that alcoholic intoxication and the tendency to drink excessively are two different things. The latter is to be regarded rather as a psychasthenic compulsion, and would therefore fall under Class II. Alcohol is often taken as a refuge from mental conflict, and when this is the case, psycho-analysis would be the proper method of cure.

We now have the first three groups left for consideration, and these are all of interest to the medical psychologist.

Maniacal-depressive insanity is a psychosis characterised by attacks of mania and melancholia, and it may be taken as a general rule that no attempt should be made to analyse these patients during the course of one of their attacks. A maniacal patient is in too excited a condition to co-operate, and psycho-analysis during an attack of melancholia tends to make the patient worse. The analysis should be undertaken between the attacks, and many medical psychologists have come to the conclusion that it should not be pushed too far. A partial analysis of a few hours, laying bare the most obvious of the patient's repressed complexes, which are very near the surface, is often sufficient to effect a permanent recovery ; whereas anything like a complete Freudian analysis only does harm. Some of the most experienced psycho-analysts, however, disagree with me on this point. I ought to say that the psycho-analyst may often obtain a hint as to the nature of these complexes by a careful study of the patient's conduct, delusions, and apparently incoherent remarks during an attack ; but the analysis itself should be postponed until the attack is over.

The analysis of dementia præcox should certainly not be

attempted by the beginner. Most of the cases are too inaccessible mentally, while some of the earlier cases are too accessible, by which I mean that within a week of starting the analysis the patient has flooded you with an enormous tangle of repressed complexes, out of which there seems to be no possibility of escape. The most favourable cases are those of katatonia. I must warn the beginner against cases of dementia paranoides for his own sake. Negative transference, which I shall be explaining later, is liable to be set up, and may induce the patient to inflict actual bodily injury upon his doctor, which may go as far as murder—a most undesirable sequel to the doctor's patient efforts.

The same state of affairs may arise in the analysis of cases of paranoia, but we also encounter another difficulty. The patient suffers from a systematised delusional state, on which he bases his whole attitude to the outside world, and he refuses to believe that there is anything amiss with his mentation. This being the case, it is only to be expected that he will refuse mental treatment of all kinds. I have not myself had the opportunity of attempting psycho-analysis on a patient of this kind, but some of my colleagues have told me that they have been successful with some cases. I understand, however, that most psycho-analysts regard the prognosis of this disease as unfavourably as it was deemed before the introduction of their method of treatment.

In Class II. we come to the cases for which psycho-analytic treatment is pre-eminently satisfactory. These are the cases upon which Freud made his earlier, and indeed the greater part of his studies. These are the cases that the psycho-analyst likes to meet. Many hysterical patients can be cured by other means, and there is no necessity for psycho-analysis until such means have failed, or unless persistent relapse occurs after the treatment.

For the compulsion neurosis, however, imperative ideas, obsessions, some morbid fears, irrepressible thoughts and morbid impulses, there is no other treatment than psycho-analysis, which is remarkably efficient and satisfactory.

Of course no psycho-analyst claims that his method is infallible, even in cases of hysteria and the compulsion neurosis. It is necessary to say this, because many of the critics like to say that he does put forward such claims. Psycho-analysis has its failures as well as its successes, just like any other mode of treatment; but we do claim that psycho-analysis is more successful than other methods in suitable cases, the reason being that each patient

is treated as an individual with a mind of his own, peculiar to himself, and not as a person suffering from a disease for which the panacea is a "rest-cure," now well known to be inefficient in many cases.

The disorders of Class I. are also suitable for psycho-analysis, but it is soon found that a complete psycho-analysis is unnecessary, because the cause of the trouble is soon found and appropriate advice can be given accordingly. I shall refer to such matters in my next lecture.

Technique.—Before beginning a course of psycho-analysis it is necessary to make sure that it can be continued. You must be sure that neither your own engagements nor those of the patient are likely to interrupt it. To leave the patient with a half-revealed complex for more than a day or two will only make him worse. For this reason psycho-analysis is ill adapted to institution work. At any rate, it cannot be carried out by medical officers whose time is occupied by administrative duties.

The patient is first systematically examined and a provisional diagnosis made. All defects in physical health are remedied, such as errors of refraction, carious teeth, sources of septic infection, nasal obstructions, and so forth.

When it has been decided that the patient is a suitable case for psycho-analysis, he is directed to sit in a comfortable arm-chair by the consulting-room table, more or less facing the doctor. This is my own method, but some physicians arrange that the patient shall face another way, so as not to be distracted by his examiner's changes of expression. Freud himself recommends that the patient lie on a comfortable couch and that the physician sit at the head of it so that the patient cannot see his face.

Many physicians begin with an association experiment, with or—more usually—without the use of a galvanometer, sphygmograph, and stethograph. If it is decided to employ these instruments, the sphygmograph and stethograph are fitted with a Marey's tambour and revolving drum for recording alterations in the frequency of the pulse and respiration. The galvanometer, if used, should be delicate, astatic, and of high resistance, and it should be arranged with its two poles lying in two basins of water. The circuit is completed through the patient, each of his hands lying in one of the basins of water. A galvanic cell generating a weak electrical current may or may not be introduced into the circuit. In an association experiment with an

ordinary patient, all these instruments are mere accessories, but they may play an important part in attempting the analysis of a suspected criminal.

The physician now takes a list of quite ordinary words, usually about a hundred, and reads them one by one to the patient. These are known as the "stimulus words," and the patient is required to react to each in succession by stating the first word that comes to his mind in association with the stimulus word. The physician works with a stop-watch, and the patient is required to react as quickly as possible; a normal reaction takes about two seconds. Opposite each stimulus word the psycho-analyst writes the "reaction word" and the time taken by the reaction.

I append here a list of suitable words, but it is as well for the doctor to introduce here and there words which appear to have some bearing upon the patient's own malady.

Quiet	Law	Correct	To play	Despise
Wall	Trouble	Pencil	Threaten	Tooth
Journey	Whisky	Woods	Habit	Book
Bible	Justice	Yellow	Dance	Wild
Apple	Work	Dream	Afraid	Box
Salt	Lion	Insolent	Child	Thirsty
Tobacco	Hammer	Ride	Sing	Hard
Cottage	Crowd	Soldier	Frog	Moon
Love	Paint	Thief	Proud	Glass
Sorrow	Rent	Green	Wool	Sympathy
Sheep	Ring	Joy	Doctor	Street
Water	To listen	Quarrel	Brother	Harm
False	Kiss	Choose	Man	To tell
Wash	Policeman	Deep	Health	Boy
Rich	Soft	Mouth	Mountain	Table
Dark	Stork	Anxiety	Rough	Duty
Window	Luck	Friend	Bed	Ink
Wish	Foot	Smooth	Girl	Carpet
Dog	Change	Dirty	Blood	Knee

The words are read through a second time and the associations again noted, but it is not necessary to record the reaction-time on repetition.

The doctor now searches his results for what are known as "complex-indicators." These are:—

1. Undue prolongation of the reaction time (four seconds or more).
2. Failure to react to a word.
3. Strange and incoherent associations.
4. Apparent contradictions.

5. Perturbation of several reactions following a certain association.

6. Failure to react with the same word on repetition of the test.

7. Accompanying motor and vasomotor phenomena, such as restlessness, lip-biting, nail-picking, blushing, etc.

8. Increase of frequency of the pulse and respiration.

9. The generation of weak electrical currents by the body or, if a cell is introduced into the circuit, alteration of the electrical resistance of the body.

By a little detective work it is often possible to make a shrewd guess at some of the patient's repressed complexes; but your own conclusions should never be communicated to the patient. It is legitimate to ask him a question which forces him to admit something that he is obviously withholding, but it is not permissible to do more than this.

The various "complex-indicators" just mentioned are due to intra-psychic "resistances." Some of these are between the pre-conscious and the conscious, and constitute resistance to a disclosure of the complex *to you*. Others are between the unconscious and the pre-conscious and constitute a resistance to disclosing an unconscious complex to the patient's own consciousness, and incidentally to you.

These "resistances" have to be overcome, and the method is to take each of the associations which have revealed themselves as complex-indicators and to get the patient to explain them. This he can very readily do with many of his associations by relating some incident in his past experience. Some will prove valueless and be discarded, others worth noting.

Some of his associations, however, will turn out to be a puzzle to himself. These are important and should be followed up. What is called "continuous association" may first be tried, the patient being told not to stop at the first association, but to go on from one word to another until some light is thrown on the first association; or the particular reaction may be used as a starting-point for a "free association" to be described presently. If, during a series of continuous associations the patient comes to a stop, a block, a resistance, he should be urged to find an association. You say to him, for example, "Go on; you must think of something!" then, after a short pause, especially when he shows some motor restlessness, "What is in your mind now? You must tell me." In this way you work through all the reactions and, by the

end of the test, you have a very fair amount of material to work upon.

The method of "free association" is conducted in much the same way, except that no stimulus words are given. The patient is directed to make himself quite comfortable and to assume a passive inert frame of mind. He is then told to allow his thoughts to flow as they will and to exercise no control of them whatever. As they flow in this way he is to speak everything that comes to his mind; no matter how incoherent his speech may seem, and no matter how painful or repugnant the thought may be, he must speak it out. He is to allow his thought and speech to run wild. In this way his associations will here and there tap the unconscious. After a few sittings you can sometimes tap the unconscious almost as soon as he enters the consulting-room by making some utterance which calls for no specific reply, such as "Yes?" or "Well?" and waiting for him to speak. It may seem ungracious or unceremonious that you should not enter into the conversation, but you must let him do all the talking.

In the course of a free association you will again come across "resistances." The patient will tell you that his mind is a blank and that he can think of nothing. You reply "Never mind! go on talking." Or he will become silent. Your reply is to become silent too. You wait for seven or eight minutes sometimes, looking at him expectantly the whole time until something comes up from the unconscious; or you interrupt the silence suddenly with "Talk! what is the matter with you! Go on talking!" or, at the slightest sign of restlessness, you say "What are you thinking of now? Why don't you tell me?"

These resistances are difficult to describe because they vary so much with different patients. I have seen a patient fall over the side of the chair, as if collapsed, remarking "Oh, doctor! what are you doing to me?"—a patient, mind you, who went about his business during the rest of the day as if there were nothing the matter with him, although he was constantly tormented by psychomotor hallucinations and other symptoms.

From time to time it is well to recapitulate to the patient what he has told you and get him to draw his own conclusions as to the nature and cause of his malady. I wish to insist a little on this point, that he tells you and that you do not tell him, because the critics like to say that the psycho-analyst puts suggestions into the patient's mind. It is true that the patient will sometimes ask, "Is that right, doctor?" to which my usual reply is, "Of course it

is right, because it is your mind that has come to this conclusion, not mine; and the malady is yours, not mine." Sometimes, of course, it is necessary to counteract some absurd conclusion, but I have found that such conclusions usually originate in a suggestion given to the patient by another person. Beginners in psycho-analysis are liable to make this very mistake. They tell the patient their conclusions as to the nature of his complexes before he has discovered them for himself. These are what Freud has termed the "wild psycho-analysts." Sometimes their conclusions are correct, sometimes incorrect. One patient of mine told me that a certain doctor after one week's analysis informed him that he was in love with his mother, to which, not understanding what was meant, he replied, "Of course I'm in love with my mother." Now it happens that the doctor was right; the patient's libido was unconsciously fixated on his mother, so much so that although the patient was forty years of age and had been in love many times, he could never bring himself to marry the girl of his choice. Psycho-analysis, as a method of bringing hidden complexes to light, has been compared to opening an abscess; but this doctor's method was more like hitting an abscess, not opening it.

I can here foresee an objection that there is no need for the psychologist if he is not allowed to supply interpretations of the patient's data or even to engage in conversation, and I have indeed had the experience of a patient who, while admitting her recovery, remarked, "But I do not see what you have done." I accepted that as a very great compliment.

As a matter of fact the work of the psychologist is at times very great at overcoming resistances, which sometimes last for several sittings. One form of resistance for which you must be on the watch is what the Germans call "*vorbeireden*"—as we should say, "talking past the point." The patient suddenly becomes loquacious and hurries past a certain association, just as a hostess at a dinner-party may suddenly become talkative and change the conversation, knowing that it is getting dangerously near a tender subject for one of her guests. The analyst's duty is the reverse of this. He brings his patient back to the point, discusses it right out, and perhaps starts a new series of associations. Then, again, it is desirable to encourage associations which promise to revive infantile memories. Such memories are usually strongly visual and difficult to associate with words; it is therefore well on such occasions to ask the patient to close his eyes, to see pictures, and

to relate what he sees. Indeed, it is helpful in all psycho-analysis that the patient should keep his eyes closed. His mental and bodily attitude should resemble that of going to sleep, in that the mind should be allowed to wander, but there is the difference that the subject's attention is directed to his own psychical activities. Of course he requires a certain amount of practice before he is able to do this successfully. His part of the work is by no means easy, and many a patient attains peace of mind at the expense of his hair turning grey; not as a result of the difficulty of technique, but as a result of overcoming resistances.

I now come to the *interpretation of dreams* which Freud has designated the "royal road" to the unconscious. In sleep, those parts of the nervous system which subserve phenomenal consciousness are more or less in abeyance, and they are only aroused temporarily by associative stimulation from the nervous mechanisms subserving unconscious activities. If these unconscious activities were allowed to become conscious, if they were allowed to rouse the nervous arrangements subserving consciousness to full activity, sleep would of necessity cease; but the constant desire of the sleeper to go on sleeping prevents unconscious activities from becoming conscious in an undisguised form, so that sleep continues under the guardianship of the dream. This will become clearer as I proceed.

The interpretation of dreams, being the royal road to the unconscious, constitutes a very important part of psycho-analysis.

We have to recognise the "manifest" and the "latent" content of a dream. The manifest content is contained in a description of the incidents of the dream as the dreamer would relate them at the breakfast table the following morning; but, by studying the mental associations of dreams, Freud has discovered that each contains a deeper meaning, which has been called the latent content. This latent content is invariably the imagined fulfilment of an unconscious wish. This is the real purpose of dreaming, to gratify unconscious desires which can obtain gratification in no other way; while it is the distortion of the dream which serves as the guardian of sleep.

In children and imbeciles, who are children who have not mentally grown up, the wish-fulfilment is undisguised. If a child dreams that it has a rocking-horse or that it is driving its father's motor-car, this means that he would like a rocking-horse or would like to drive the car. In a child very little repression has yet taken place, and therefore unconscious mentation plays a very small

role in the mind of the child. In an adult, on the other hand, the wish-fulfilment is disguised and distorted so as to be unrecognisable by the phenomenal consciousness of the dreamer. I shall not have time to discuss fully the psychology of this distortion, but I may say that roughly it is necessitated by the censorship existing between the unconscious and the preconscious. The disguise is assumed so that the dream material may pass the censor into consciousness.

Before discussing the mechanisms of this distortion, let me say that the material upon which a dream is based consists of—

1. Some incident of psychical importance on the day before the dream—the dream-day—or at least some memory, occurring during the dream-day, of some incident of psychical importance.

2. Some memory of long ago, usually early childhood.

3. The fulfilment of an unconscious wish. This may be incited by a wish during the dream-day which circumstances prevented being gratified, or by a wish unfulfilled and suppressed during the dream-day or by some wish arising from the unconscious during night or by an actual wish-incident occurring during sleep, such as thirst. Freud considers, however, that a wish occurring during dream-day is insufficient to provoke a dream unless it is reinforced by an infantile wish.

It may be taken as a general rule that all the dreams occurring in the same night refer to the same subject, and most people have had the experience of a series of dreams occurring on successive nights, obviously relating to the same subject. In such a series the wish-fulfilment is more boldly expressed and less concealed in the latter dream than in the earlier. It is therefore wise to start the analysis of such a series by taking the last dream first.

That the dream actually has a secret meaning which turns out to be a wish fulfilled must be proved afresh for every case by means of an analysis, which I shall describe later; but it is helpful to know what are the mechanisms of distortion, although dreamers themselves will tell you this to a certain extent as the analysis proceeds.

The mechanisms of distortion are exactly the same as those which produce symptoms of the psychoses and psycho-neuroses, viz. Displacement, Condensation, Symbolisation, and Dramatisation. These and some other features of dreams I will briefly explain.

1. *Displacement*.—The unimportant details of a dream are often

the most significant, as also are the parts which are vague, subsequently forgotten (repressed) or are related differently on being told a second time ("secondary elaboration," to which I shall refer again). It is best to start analysing a dream at such parts. Similarly when a person has a "dream within a dream," when he dreams that he wakes up from a dream and goes on dreaming, saying to himself "Why, I was only dreaming," such "dream within a dream" is important. By this I mean that disguise is regarded by the censor as incomplete, and that analysis should therefore be so much less difficult.

2. *Condensation*.—Almost every element of a dream represents not one, but a number of unconscious thoughts fused into one conscious thought, so that the element is said to be "overdetermined." For example, Freud relates that a lady dreamed that she had crushed a ladybird in shutting down a window. This incident in the dream condensed the following thoughts:—She had allowed a moth to drown in a glass of water, she had read a story the evening before of some boys throwing a cat into boiling water, she was occupied with the subject of cruelty to animals, years before her daughter used to be cruel to insects by pulling off their wings, she used to collect butterflies and used arsenic to kill them, during the same year there was a pest of ladybirds, and the children used to crush them, at the same time she saw a person tear off their wings and eat them, and so on.

Such condensation is not an exception, but the rule. Persons, for example, who are unknown to the dreamer are regularly composite persons constructed from several people he does know. Sometimes such condensation is accomplished by the presentation of the features of one person with the mannerisms and speech of another. Condensation causes vividness of the presentation and, *vice versa*, vividness implies condensation.

3. This is a convenient place to mention that dreams are always egotistic and that the dreamer himself is always represented. Indeed, he is always the chief actor, and a person in the dream whose features he cannot recognise may be himself. If there is difficulty in deciding which of two unknown persons represents the dreamer, it is a safe rule to assume that it is that one whose emotional experience is the greater. This brings me to another subject.

4. *Emotional Affect in Dreams*.—The emotional tone attaching to any percept in a dream is never distorted. It is always correct. It is true that the affective tone may not appear, but when it does,

it is always the correct one for the situation. The situation, however, is disguised; so that pleasure may be felt when the dreamer meets three lions in the desert, the lions symbolising three friends, or fear may be expressed when the dreamer has the chain of mayoralty placed around his neck, if the chain symbolises the hangman's rope. This brings me to the subject of—

5. *Symbolisation, which is Rife in Dreams.*—In the majority of cases, symbols are a cloak for some sexual idea. Emperor and empress and king and queen are the dreamer's father and mother. Right and left often mean right and wrong in a moral sense. Architectural symbolism is quite commonly employed for the architecture of the body; and the associations belonging to plant life and to cooking are often chosen to conceal sexual images.

6. In this connection I may refer to "somatic displacement." A patient of mine dreamed that she had an intense headache which was relieved by her emitting masses of red flesh from her mouth. Analysis revealed that the dream was the disguised fulfilment of a wish to have another child.

7. Inversion or representation of the opposite is common. As examples, another person's attempt to kill you may represent an unconscious wish on your part to get rid of him. The sequence of events may also be transposed. I ought here to contradict in part what I have said about the emotions in dreams, viz. that they are always correct if applied to the latent content. It happens occasionally that an emotion is represented in a dream by its opposite. Inversion of some particular element usually means that something else in the dream is also inverted.

8. The doctor himself, the psycho-analyst, is often represented in the dreams of patients. In a particularly transparent dream a patient of mine found herself in church. There was a large congregation, including a certain clergyman, the Rev. X., while another clergyman, whom I will call Y., was conducting the service. The Rev. Y. and the whole congregation then vanished or left the church with the exception of the Rev. X. and my patient. On analysis the Rev. Y. turned out to be myself and, when I tell you that a crowd or multitude of people signifies a secret, the interpretation becomes clear. The patient had a secret which she did not wish to reveal to me, but wished to do so to the Rev. X. There was no congregation, *i.e.* no secret, when I had gone.

9. *Dramatisation.*—Incidents, people, and things are selected

and arranged so as to present the dream in a more or less dramatic form. Both past and future become the present so as to fit into the picture.

Conjunctions such as "if," "although," "as though," "either, or," and "because," do not occur in dreams. Logical relationship is represented by simultaneity, "because" by succession in time, and "either or," is equivalent to "and" in the dream.

10. *Secondary Elaboration.*—Dreams are not commonly related with the strictest accuracy, even when the sleeper wakes, and they are frequently changed here and there on being related a second time. In waking moments the censor is more alert and the latent content becomes still further disguised in order to render it acceptable to clear consciousness, and just in those parts where there is an unconscious feeling that the disguise is not sufficiently complete. These therefore are favourable points for starting the analysis of a dream.

A dream is usually analysed easily if there has been much resistance to relating it, or when there are such remarks as "But it was only a dream!" Or "What is the use of telling it? That will not help me." Attention should always be paid to such comments on the dream, and they should be regarded as part of the latent content.

In analysing a dream it should be taken item by item. The patient should be asked who or what is represented by the item. He should be directed to form a series of associations with it, and told to speak everything that comes to his mind, as has been described as free association. Often it is useful to start again from the beginning, when it is usually found that the associations lead by another path to the same conclusion, except where there is condensation.

The associations of various items are then reviewed and the patient is asked to state his conclusions as to the meaning of the dream. The doctor then assigns it to its particular complex for future use.

Of course an experienced psycho-analyst can often see the meaning of a dream more readily than the patient, but he should always offer any interpretation tentatively, saying, for example, "Of course you will be able to tell me whether the interpretation I am about to suggest is correct or not. If I am wrong, please say so." If the interpretation is right, the patient will often acquiesce quite readily. If incorrect, his reply is something like "Oh no! I am sure it does not mean that." If the interpretation

is only partial, and if it is partly right and partly wrong, he will say "It might be," or "I don't think so," indicating some uncertainty. It quite frequently happens, however, that a correct interpretation induces the strongest denial and resistance to insight; but his protestation is too much, and the very stoutness of his disclaimer betrays the fact that the interpretation is correct. It is better, however, to leave a dream unexplained than to force your own construction on the patient.

Again, in psycho-analysis generally, it may be desirable, after recapitulating the data already obtained, to explain your own interpretation of the patient's symptoms. For example, symptoms occasionally arise as a result of repressed homosexuality, the patient having no idea what homosexuality is, or not even knowing that it exists. In such a case it would be necessary to explain this to the patient.

I will conclude my remarks about dreams by quoting a footnote from Freud:—"In general it is doubtful in the interpretation of every element of the dream whether it (*a*) is to be regarded as having a negative or positive sense (relation of opposition); (*b*) is to be interpreted historically (as a reminiscence); (*c*) is symbolic; or whether (*d*) its valuation is to be based upon the sound of its verbal association. In spite of this manifold signification, it may be said that the representation of dream activity does not impose upon the translator any greater difficulties than the ancient writers of hieroglyphics imposed upon their readers."

Dreams are so important and helpful in psycho-analysis that I have taken them as a pattern of the various clues and hints of what is going on in the unconscious; but we can often obtain many suggestions from apparently trifling incidents and habits occurring in the patient's everyday life.

I have already mentioned the "press of conversation" or "vorbeireden" occurring during an analysis as a complex-indicator. Similarly, the patient may assume a sudden laughter or merriment during the serious work, and obvious attempt to disguise a painful thought. He may abruptly start picking his nails, or a woman may toy with her hair or write figures with her finger on her lap. Twitches of the mouth and eyes, and many such trifles, all of which I have seen in patients, all mean something, and the meaning has to be elicited by analysis.

I have referred in my first lecture to such "symbolic actions" as the old maid keeping many pets or interesting herself in the newspaper reports of divorce scandals.

A common experience of psycho-analysts is that patients leave some of their belongings after a satisfactory interview. This is an unconscious way of expressing a wish to return for further treatment.

People who have displayed a tendency during childhood to pilfer or lie, and who still have an unconscious tendency in the same direction, are scrupulously careful to pay for everything "on the nail," as the saying is, or to be excessively precise and truthful whenever they make a statement, thus giving a hint of their repressed complex.

A spendthrift usually has all the apparatus for saving money—cash-box, ledger, day-book, and the rest of it—but his unconscious tendency prevents him from using them.

These are generalities, but patients and others often supply particular examples of the work of the unconscious. Dr. Bernard Hart quotes a patient, for example, who had an irresistible impulse to examine the number of every bank note which came into her hands. Analysis revealed that this habit dated from an occasion when she asked a man, with whom she was in love, to change a coin for her. He complied with her wish, and, putting the coin in his pocket, said that he would not part with it. This remark raised her hopes that her love was reciprocated, and any money passing through her hands always reminded her of the incident. The man passed out of her life, however, and she strove to banish the episode from her memory and to forget that such a desire ever crossed her mind. The repression was successful, and the complex was thenceforward only allowed to enter consciousness in disguise, viz. as an interest in money, which became crystallised into her exaggerated preoccupation with the numbers of bank notes.

An illustration from Jung. An old female patient of an asylum spent all her time huddled up and performing a stereotyped action resembling that of a cobbler sewing boots. Investigation showed that she had as a young girl been engaged to a shoemaker and that the engagement was suddenly broken off.

Freud has demonstrated that the forgetting of proper names, far from being fortuitous, is always due to the activity of the intrapsychic censor. Whenever a name is forgotten or incorrectly remembered, a reason can always be discovered, usually by a quite superficial analysis, why it has been forgotten. Some disagreeable memory is the common cause, associated either with the individual or with a person or place of the same or a similar sounding name. In other words, the forgetting is nothing more or less than a

repression. Examples of this occur in everybody's experience every day. I always have a difficulty in remembering the name of a certain town in Italy, Ferrara, where, owing to a piece of foolishness, I had to run for nearly a mile in record time in order to catch a train in which I had already placed my luggage. The forgetting of resolutions belongs to the same category of unconscious phenomena, the commonest example being that we are more liable to forget having borrowed money than having lent it, although none of us would admit to ourselves that we have dishonest propensities.

The mislaying of objects gives another series of clues to the unconscious. I have already mentioned that patients are liable to leave some of their belongings, usually an umbrella, in the halls or waiting-rooms of psycho-analysts. Bills are more apt to be mislaid than cheques. If a cheque is mislaid, you will find that you have a feeling that you have not given sufficient value for the money, or that you have failed to declare it to the income tax authorities, or that you do not like the person who gave it to you, or there is some other unpleasant association with the cheque.

Mistakes in speaking, reading, and writing (*lapsus linguae et calami*) belong to the same category. They are betrayals of repressed complexes, and no psycho-analyst allows such a mistake made by himself to pass without searching for the hidden cause of it.

Similarly, he always gets his patients to relate to him such symbolic actions, failures of memory, and lapses of the tongue and pen, so that he may investigate them and thus gain access to the unconscious tendencies of his patients.

Perhaps I ought to mention two other methods of tapping the unconscious, which do not, however, belong to psycho-analysis proper.

Crystal gazing is one. It does not require much practice and is quite easy for a neurotic patient. He is directed to abstract his mind from all normal sensory impressions and to gaze intently into a glass sphere, such as I have on this table. A black background is preferable, and it is advisable not to have too much illumination. Clouds appear in the ball at first, which advance and retire synchronously with respiration. Then the many reflections are unconsciously combined to form an illusory picture which is at first vague and indistinct, but the unconscious soon fills in the details. Definite hallucinations then form which ultimately take on movement. These hallucinations represent some forgotten

incident of the past life of the individual, with much less distortion than takes place in dreams. The percipient, being detached from surrounding impressions and awake only to those of his own subconscious self, is probably in a mild state of hypnosis.

The patient relates to the doctor all that he sees in the crystal ball, and, the memory of some incident having been revived, he is urged to connect it with his present content of consciousness by the association methods already described.

The method is not much used, but I have sometimes found it helpful in overcoming resistances in the interpretation of dreams.

Hypnosis is the last method which I shall mention of penetrating the field of the unconscious. It is explained to the patient that he is to be hypnotised, and the object of the procedure is expounded to him. He is directed to offer no resistance, but to allow his mind and body to become perfectly supple and flaccid, and he is told that failure to hypnotise him will be due to resistance on his part, all hypnotism being, in fact, auto-hypnotism. One of the various methods in common use is then employed.

On account of unconscious resistance, however, it is quite unusual, except in hysteria, to obtain deep hypnosis in a neuro-pathic patient. Should the hypnotism be so successful as to abolish his normal consciousness his unconscious mind is laid bare, and it becomes possible to discuss with him details of incidents which in the waking state are completely forgotten. Such a state would be ideal for the recovery of repressed complexes if it could be easily induced; but it was this very difficulty that caused Freud to give it up in favour of his method of free association.

It is a matter of experience that persons who have been partly psycho-analysed are very easily, but not deeply, hypnotised; but people who have been completely psycho-analysed right back into their earliest years of infancy cannot be hypnotised at all, presumably because they have no unconscious.

If a person is to be psycho-analysed I prefer that he should not be hypnotised. For some reason or other, previous hypnosis appears to increase resistances, to augment the power of the censure.

Patients who have undergone a course of hypnotism are, in my experience, unsatisfactory to treat by psycho-analysis. Hypnotism should, as a rule, be used for post-hypnotic suggestion only.

The Transference.—In the first lecture I explained that every

constellation of ideas which we call a "complex" is possessed of a certain amount of psychical energy or horne, desire plus a conative trend; and it is this horne or libido which usually conflicts with the herd instinct and brings about that mental conflict which secures adjustment by repression of the whole complex into the unconscious. Fixation of the libido in the unconscious may be on the father (Edipus-complex), on the mother (Electra-complex), on a person of the same sex as the patient (homosexual-complex), on a person of the opposite sex who has passed out of the patient's life, or even on an inanimate object (money, for example). When, therefore, by the methods I have described an unconscious complex becomes conscious, this libido becomes conscious too, but this time its object is not available. The method of psycho-analysis has itself divorced the libido from its former object. There is, therefore, a certain amount of libido, synonymously psychical energy, floating free, so to speak. What becomes of it? Such a state of affairs cannot possibly persist. It becomes attached to or fixated on the personality of the physician. This is a stage which must be attained by every patient, and is known as "the transference." To some extent a similar feeling of dependence and confidence occurs in every patient, whether he be suffering from heart disease, phthisis, cancer, or any other organic disease; but it is enormously exaggerated in the neuropath who is undergoing treatment.

All psycho-analysis proceeds *via* transference. Psycho-analysis means using transference for the purposes of treatment, it being the only way in which buried memories can be recovered. It is often difficult to see how on earth certain infantile fixated relationships can possibly be transferred to the physician, but the patient's unconscious mind discovers a way, usually with the help of a dream. When, as commonly happens, the infantile fixation is of a hostile nature, the patient's unconscious mind is most insulting to the physician, although superficially he is as polite as ever. Under such conditions, when the transference has been effected, it may be very disagreeable, and, indeed, dangerous. In patients suffering from delusions of persecution, for example, the patient then regards the physician as his persecutor. Jung of Zurich told me of a patient of his who presented him on recovery with a loaded pistol which, during the stage of transference, was intended to be levelled at him. This is known as "negative transference." It must never be forgotten that during the transference the neurosis is as active as ever. There is a recrudescence of many of the symptoms of the former neurosis, with the difference that some

earlier person is replaced by the person of the physician. A similar transference on the part of the physician has to be guarded against ("reversed transference" it is called), and is to be avoided by self-analysis.

It is the commonest complaint of neurotic patients that they are not understood, but in the psycho-analyst they have found a man who listens sympathetically, tries to understand them, and never gets annoyed by their constantly recurring resistances. The doctor has become a kind of father confessor who has penetrated the secrets of his soul far deeper than any father confessor ever does, while the patient has found a prop against which he may lean for evermore. He considers the situation ideal, and resists all attempts to alter it, even reverting to all his former phantasies in their new relationship.

This is the state in which the father confessor would leave him, but the psycho-analyst must place the patient upon his own feet. In other words, the next stage in the treatment is dissolution of the transference relation. This is the most difficult part of psycho-analysis, because the resistances are stronger than ever. It is to be accomplished in exactly the same way in which the transference-relation was produced, viz. by psycho-analysis. In this, dream interpretation will again play a prominent part, for it will now prove a useful guide in our search for the future object of the libido. We must find new interests for the patient, and encourage him in them, so that he may come once more into practical relationship with the world around him. During this process all his symptoms crumble away, and, in the end, he finds himself neither better nor worse than other members of the community around him, but just a normal person.

(To be continued.)

THE WAR AND PSYCHIATRY.

By ISABEL EMSLIE, M.D.

WE are at present, owing to the war, passing through times full of stress and strain. Life for practically every class of society is harder than in time of peace. The lower and middle classes are those most affected by altered economic conditions, but all classes suffer in common from the strain, anxiety, and bereavement which the war brings. Much of our thought and conversation is continually running on war topics, and whichever way we turn, we are constantly reminded of it in one way or another.

It is interesting to note, then, what part all this plays in mental disorder among civilians, and whether or not the war is playing a part in the causation and in the increase of insanity. Of interest, also, it is to note the effect of the war on those already suffering from mental disorder, and to see what class of case is specially affected by it.

THE WAR AS AN EXCITING CAUSE OF INSANITY.

Judging by the number of admissions here at the Royal Mental Hospital, Edinburgh, it cannot be said that since the war there has been any increase; therefore, roughly, it cannot be said that the war has been, up till now, at least, a cause of increase in insanity. It is true, however, that the war has been a real exciting cause in some of the admissions. There were 15 admissions in which a pretty clear history of this was obtained.

Of these 15 cases, 6 were women and 9 were men. Six of these patients had had previous attacks, 1 was feeble-minded, 1 was feeble-minded and a drunkard, and 2 at least were of a very highly strung temperament. This leaves only 5 practically normal people who were affected by the war, the other 10 being persons who would readily have broken down under any extra strain which happened to come in the way when their resistance was lowered. The class of case was as follows:—Acute confusional insanity, 5 cases; melancholia, 3 cases; mania, 2 cases; dementia præcox, 2 cases; paranoia, 3 cases.

There was no doubt felt that the war was the real exciting cause of the illness of these patients, even if a history of this had not been obtained from the friends. Each case was typical of its own class, and showed in every detail of thought, action, and speech the great part the war had played in the causation of the illness.

To show some of these facts notes on 3 of the 15 cases are given below.

CASE A.—Woman, æt. 50 years. Melancholia. Second attack.—She was admitted 3 days after the declaration of war. She was absolutely well until war was declared, and was not in the least depressed or run down. She had nothing to worry about, and she knew nobody who would be likely to be called up for service. She became painfully agitated and depressed, wept a great deal, and said it was she who had caused the war. She went entirely off her sleep and would not eat. She never spoke unless to bewail the fact that she had sinned in causing the war. On the third day of her illness she was brought here. For the

first few weeks she was with us she continually cried out that she was the cause of the war, wept and wrung her hands, and asked for pardon for what she had done. At times she sat up in bed in a perfect frenzy of fear listening for the sound of big guns. At any noise, however small, she would start, and the whole bed would shake with her tremors, as she construed the noise into that of distant guns.

She gradually settled down and became convalescent, when she took a most intelligent normal interest in the war and in the knitting of comforts for soldiers. She was discharged recovered on 15th October 1914.

CASE B.—Woman, *æt.* 29 years. Acute confusional insanity. First attack.—This patient is now quite clear, and attributes the whole cause of her illness to the war. She was feeling slightly run down at the time, and was worried at one of her brothers having enlisted.

This patient's home was near a naval base, and so she was brought into much closer contact than most people with naval and military affairs. She said she was much worried by the number of search-lights, and thought that they were specially played on her. The number of sentries worried her also, and she thought they were watching her. All the restrictions about lights and other things were specially made to catch her, and so on.

She said she was afraid the British took her for a German spy. She had signalled to ships in the Firth and had taken both English and German codes. She became very much afraid that the *Emden* would land at her home and that the Germans would suspect her as a spy and shoot her. She had a man friend in the Admiralty, and she went about in terror that she should meet him. She said he always could get all her secrets from her, and now he would get the secret of the codes and she would get into trouble. The people who stayed next door kept pigeons, and she was terrified that the British would suspect her of sending messages by carrier pigeons.

She became unable to go out by herself, as she feared spies were following her. She got very nervous and hysterical, and after about 2 months of this strain broke down and came in here in a state of acute confusional insanity. She was in a mixed state of extreme confusion and extreme terror, and wanted someone beside her all the time lest harm should come to her. Some of those about her she trusted and others she was not at all sure of, and was afraid of spies in the house.

She has gradually recovered, and talks freely about the delusions which she held. She now takes a calm, intelligent interest in the war, and helps with knitting for the soldiers.

CASE C.—Woman, *æt.* 35 years. First attack. Acute confusional insanity.—She always was nervous and highly strung, but never showed any signs of mental affection till the declaration of the war.

She then began to get very depressed, and worried greatly about the war. The atrocities shocked her very much, and she wept over them a good deal. She began to be very apprehensive of bombs, guns, and aeroplanes, and was afraid that they would come to this country. The newspapers had such an effect on her that she was stopped reading them by her doctor. Another factor aggravating the case was that her husband was very much away from home on Government business concerning the war. She was very much left alone and brooded a great deal.

She gradually became worse, and was sent to Ward 3, Royal Infirmary, Edinburgh, and from there was sent on here.

She was in a state of complete confusion, and was terrified at what was to happen to her next. At every new move she screamed out in terror thinking it had something to do with the war. She has gradually cleared up, but even yet cannot bear to read the papers, and never discusses the war.

WAR AS A FACTOR IN THE CASES ADMITTED.

There were many admissions in which the war, though not a real exciting cause, still must have played some part in the aggravation of the disorder, as it coloured the actions and speech of the patients not a little.

This was specially noticed in cases admitted during the first month or two after the commencement of the war, and was much more common in the women patients. It is not nearly so noticeable now among the admissions, and it would seem that the mental shock of the war is not nearly so sharply felt, and does not excite the unstable mind so much now as it did when the blow first fell.

All classes of insanity were represented under this category.

The melancholics, with their many ideas of blameworthiness, readily attributed the cause of the war to themselves.

The maniacs in their incoherent flow of language had much warlike talk of territorials, batteries, aeroplanes, bombs, and guns.

They shouted out drill instructions—"Right turn! Quick march! Stand at ease," etc.

The general paralytics had grandiose ideas about the strength of our Army and Navy, and the paranoiacs' usual delusions of persecution were often connected with Germans.

Each class of case, then, had its own typical symptoms, but these were coloured in many cases by the war.

THE EFFECT OF THE WAR ON THOSE ALREADY SUFFERING FROM PSYCHOSES.

Such a great affair as the present war might be readily supposed to have had an effect on patients already suffering from some form of psychosis.

It can be said that in no case has the war caused any of the patients to relapse. If they were going on towards convalescence at the time of the war they went straight on undisturbed by war news. Those who were quite convalescent kept so, and though suffering from a natural anxiety did not relapse. They took a normal intelligent interest in the war, and the women (and a few of the men!) began to knit industriously for our soldiers and sailors.

The melancholics under treatment were utterly apathetic; they heard those around them discussing the war but it did not worry them in the slightest. They took no interest in the news, and were not in the least shocked at the horrors of the war. They did not seem to be at all apprehensive of danger to their country or themselves. They were far too much taken up with their own troubles to bother about anything else. It was only when they were improving that they showed any interest at all in the war.

The maniacs were affected just as might be expected—always quick to pick up news, words, or phrases; always quick to hear sounds, such as bands and practice firing; always quick to notice any patient's friend who might be in uniform, or any picture of war in the magazines—much of their talk and actions began to be coloured by the war. They began to talk familiarly about the various generals and commanders, to talk of guns, soldiers, and sailors, and to shout words of command. Some of the women talked about going to the front to show them how to fight, and demonstrated how they proposed to do so, and some of the male patients have even attempted to enlist.

The cases of dementia præcox spoke little about the war unless those in the very early stages of the disease. The delusions here

were fleeting and bizarre but very incoherent. One girl said that the war was caused by too much mustard and vinegar having been put in the Kaiser's soup, but that cake, apples, and treacle would bring about peace. One early case remarked knowingly that she had caused the war, and that it would never cease until she got her discharge from here.

PARANOIA.

The class of case that was quite the most interesting in its relation to the war was the systematised delusional case. Practically all of these patients have taken the greatest interest in the war news, and have followed the course of the war with seeming intelligence, and have entered into discussions with each other and with the staff. The women have worked most diligently at comforts for the soldiers.

It is surprising to note that although they take such an intelligent interest, yet beneath it all how very distorted their whole view of the war is. The majority of the paranoiacs keep their peculiar delusions well hidden, but occasionally they are found off their guard. Very often the delusion has been got by a nurse who is a special confidante of the patient. Sometimes the delusions have been got by a fellow-patient, which fellow-patient has often some equally distorted idea, yet she is much amused by the delusions of the other patient. The diversity of the delusions of this class of patient is so great that only a few of the more interesting ones are appended below.

CASE A.—An Orcadian. This patient is not at all interested in land fighting and refuses to discuss or take any interest in it, but is very interested in sea fighting. She says that the real cause of the war is the attempt to decrease the population of our Islands. This is to be accomplished by the Germans attempting to sink our ships—the fish are poisoned by eating the bodies of the dead sailors, we eat the fish which have fed off those bodies, and we die from poisoning. She was always very fond of fish, but ever since the *Amphion* went down she has had this delusion and has eaten no fish.

CASE B.—Says the war has been caused by T——— N———; if he meets his cousins in London the war will stop. At other times this patient puts the whole blame of the war on the chaplain, and says he can stop it if he wishes to.

CASE C.—This patient has for years been persecuted by five men who follow her and torture her in every conceivable way. At present these five men are German spies and they are conspiring against Britain. She is in a great state about the responsibility that is on the house for not clearing them out, as Kitchener will never stand it and will punish us.

CASE D.—This patient is the subject of many delusions of persecution. Since the war has started she is satisfied now that they must all have been connected with the war. She can look back and follow out each incident as having been connected with German spies, though her illness began over a year before the start of the war. She says the Germans are still following her, and that she will never feel safe until the war is over.

CASE E.—This patient says she could easily have prevented the war; she has done this often in olden times. It will stop of its own accord when she stops giving her usual monthly allowance to them; they will then require to stop for lack of money.

CASE F.—This patient says that the war is really a plot to secure her money. She has an enormous amount invested in a bank in Germany, and the Kaiser (who is really Mr. W—— of Selkirk) went to the bank inognito to get her money. Immediately King George (whom patient says is her cousin) became aware of the fact, he got up in arms against the Kaiser, and this is the origin of the war. This patient often 'phones to King George and tells him to proclaim peace, and offers him large bribes to do so. Unfortunately as soon as she starts 'phoning to the King another patient (who occupies the same bedroom) 'phones to De Wet not to proclaim peace, and so the war goes on. Each of these patients imagines that the other is in league against her, and has laid an intricate network of spies and telephones for the purpose of catching her.

CASE G.—This patient says she is the wife of General Oxford, who is in Edinburgh Castle in charge of a battalion of soldiers. The cause of the war was a quarrel between the "King of the Old World" and the "King of the New World." She says there has just been a war in England between "Royalists" and "the rest"; Royalists were victorious, peace being signed at "Tiflis." She can stop the war if she chooses as she is "the Lady Britannia."

CASE H.—This is a very much persecuted and at the same time grandiose lady. She says the whole cause of war is greed as in her own case of persecution, but that her own case is much more important than 100 wars.

CASE I.—This patient says that there are many German spies among the nurses. They “worked” on her with electricity and she threatened that if they did not stop their tricks that she would cause a war. They refused, so she started the war, and will not stop it until the German spy nurses stop “working” on her.

CASE J.—This case talks familiarly about all the generals, whom she calls by their Christian names. When they have leave they come to see her. At present her husband is Lord Kitchener. She says, smiling knowingly, that the war is on account of the plague which is raging in France at present, though it is only she among all the civilians who knows the secret.

CASE K.—This patient has many delusions about the war. Among other things she declares that the Kaiser and Kaiserin are living actually in this house, and are here spying on the British. She was at a cinematograph entertainment here some weeks ago and the Kaiser was shown on the screen. She laughed heartily, as she thought it was such a joke that the Kaiser should be shown when he himself incognito was working the cinematograph. She says that her brother (long since dead) is aide-de-camp to King George at the front, and that she herself is out in France all day nursing the wounded.

CASE L.—This patient says that long ago she could have told that this war was to take place. The Kaiser, whom she knows, has told her so. She is well acquainted with Kitchener and “Smith Dorry,” and gets messages by wireless. She rings up and speaks in the corner of the room, and at any time can get the latest news by wireless from the front.

CASE M.—Says the war has been caused by the marriage of the Kaiser’s daughter to the Duke of Cumberland. He naturally would tell her all England’s secrets and she must have told them to her father. Had she married a German there would have been no war.

At least six of this class of patients declare that there is no war. It is “all lies”—only stuff to fill up the papers and make

them sell—only “asylum gossip” and “asylum fabrication.” At the same time all these ladies knit comforts for the soldiers and sailors and also read all the war news with seeming interest.

CONCLUSIONS.

In conclusion it may be said that the war has not made any increase in insanity as far as civilians are concerned—this paper does not deal with those who have actually experienced warfare. Among those in which insanity may be said to have been caused by the war, the great proportion of cases are those people who have had previous attacks and those who are weak-minded or very highly strung. Few normal persons seem to have been affected.

Many of the admissions, though not actually caused by the war, show that it was playing a large part in their psychoses. This was very noticeable in the admissions which occurred in the first month or two after the commencement of the war. It has gradually got less and less frequent, till now it is rarely seen. This would seem to show that the mental shock of the war is not so keenly felt now by the unstable mind as when the blow first fell.

Of patients already suffering from psychosis when the war started, it could not be said that one had a relapse which might be traced to the war. The patients who were most affected were the paranoiacs, who, though they apparently had a normal outlook on the war, had their own distorted views of it and had developed many and varied delusions.

STUDIES FROM THE PATHOLOGICAL DEPARTMENT
OF THE UNIVERSITY OF EDINBURGH.

CASE IV.

PULMONARY AND INTESTINAL TUBERCULOSIS WITH TUBERCULOUS
EMPYEMA, TUBERCULOUS SEPTICEMIA, AND TERMINAL
INTESTINAL HEMORRHAGE.

Day Book, 989.

Museum Book, 657, 658, 659.

P. S., male, aged 42, manager of a store, was admitted on 23rd January 1915 to Ward 6 of the Royal Infirmary, Edinburgh, under the care of Mr. Dowden. The immediate cause for admission was that the patient was diagnosed to be suffering from empyema, causing great shortness of breath.

In the family history it is noted that a brother died of phthisis. From the previous history it appeared that the patient occupied a position involving hard work and responsibility; for about a year he had suffered from neurasthenia, manifested by sleeplessness, loss of appetite, and hot feet, the last symptom troubling him a great deal. In May 1914 he had been under the care of Dr. Harry Rainy, who several times carefully examined him and had found no evidence of disease of the lungs or other organs; there was, however, slight arteriosclerosis. He reported that he had been making progress under treatment, but in December 1914 he contracted an influenza, during which he was found to show signs of effusion into the left side of the chest. During the week previous to admission this had produced urgent symptoms, and he had been seen at his home on Wednesday, 20th January, by Dr. Rainy, who on that day aspirated the chest and drew off 5 pints of fluid, containing a certain amount of pus. As this procedure did not give marked relief, the patient was sent to hospital for the surgical treatment of the chest condition.

On admission the patient was found to be a very unhealthy-looking man suffering from marked dyspnoea, which caused the extraordinary muscles of respiration to be brought into action. The respirations on the day of admission ran from 32 to 40 per minute. There were no respiratory movements on the left side of the chest, and bulging of the intercostal spaces was observed. There was marked dullness on the left side, and no breath sounds could be detected.

The pulse-rate was 116 per minute on admission, but fell to 92 in the evening. The blood-pressure was low. The heart sounds were faint, but there was no valvular lesion detectable. The temperature was 98.4° F. The urine was of specific gravity 1026, the reaction acid, and there was a trace of albumen. There were no intestinal symptoms.

Shortly after admission the chest was again aspirated and 65 ozs. of fluid withdrawn. This was sent to the Pathological Department of the Infirmary, and subsequently a report was received that it contained a pure growth of the pneumococcus. The patient was slightly relieved. On the following morning the temperature rose to 100° F., but sank to normal in the evening; the pulse-rate on that day was 108 and the respiration 36. On 25th January the temperature was 99°, and the patient was apparently *in statu quo*; about 6 P.M. on that day he suddenly collapsed, and died in a few minutes.

The post-mortem examination was held on 26th January. The body was well developed and fairly well nourished. Varicose veins were present in the left leg.

Thorax.—The left pleural sac was filled with blood-stained fluid of a somewhat sticky character and the pleura was thickened and covered with a layer of fibrinous exudate. The pleura over both lobes, and

also the parietal pleura, was about a quarter of an inch thick, and the surface was ragged and congested. The whole pleura, visceral and parietal, was removed with the thoracic organs, and formed a huge sac in which the effusion during life had been located (Fig. 1 *a*). The left lung was completely collapsed, and on cutting into it was found to be airless. There were some caseous foci in the upper lobe, and one of these, about the size of a hazel nut, was softened and broken down; in the rest of the lung there were a good many miliary tubercles. The larger bronchi were congested and contained a thick tenacious secretion. The right pleural sac was dry, and there were adhesions over the upper part of the right lung. The right lung itself was voluminous, and showed a large number of scattered tuberculous foci, which were of varying size. Towards the lower border posteriorly there was an infarct. There was a large mass of caseous glands in the bifurcation of the trachea, and this was partly calcified.

Heart.—The pericardial sac contained some blood-stained fluid. The heart was rather small. The mitral and aortic valves showed slight thickening at the margins, but otherwise the valves were normal. In the commencement of the aorta and in the right and left pulmonary arteries, and also in the coronaries, there were some patches of fatty change.

Abdomen.—The intestines were distended and discoloured, and numerous areas of constriction in the small intestine could be observed from the outside. At these points the covering peritoneum contained small yellow tubercles. There was a Meckel's diverticulum 3 inches long. The large bowel had a dark purple colour, obviously from containing blood. There were a number of large soft mesenteric glands, and from one of these pus was expressed on section. On opening the stomach a few scattered hæmorrhages were seen. In the small intestine there were a large number of typical tuberculous ulcers, extending down from the beginning of the ileum to the ileo-cæcal valve. They were transverse in direction and had an irregular thickened margin and floor. These ulcers and the surrounding parts of the intestine were infiltrated with blood. The lower part of the small intestine and the large intestine were filled with altered blood. The liver was somewhat enlarged, and was pale, soft, and friable; it showed fatty change. On careful examination the lobular structure could not be made out, and minute streaky patches of congestion were observable; there were a few miliary tubercles scattered throughout the organ; there were a number of enlarged grey glands situated behind the organ. The spleen was enlarged and showed patches of chronic thickening of the capsule; it was fairly soft in consistence. On section it showed congestion and miliary tuberculosis; there was no evidence of waxy degeneration. The kidneys, beyond being slightly pale, were normal, but they contained

numerous minute scattered tubercles. The pancreas showed some congestion. The suprarenals were enlarged, but otherwise normal. The abdominal aorta was normal.

MICROSCOPIC APPEARANCES IN THE ORGANS.

Left Lung.—The lung shows some emphysema, and the capillaries are generally congested. It contains small areas of consolidation of various sizes. These are chiefly interstitial in position, and are especially marked round the bronchioles and vessels, and also occur in the interlobular septa, as is shown by the presence of a considerable amount of pigment in some of them. In many of the nodules there is externally a concentric lamination, which suggests capsulation, and, generally speaking, the condition tends to be fibrotic, although in a number of cases there is a degree of central caseation. There is some endarteritis in vessels involved in the process. There are sometimes present in the consolidated areas recent tubercular foci with occasional giant-cell formation; in the neighbourhood of the consolidations there is a good deal of tuberculous broncho-pneumonia, mostly recent in type. In the older parts of the lesions tubercle bacilli are scanty, but organisms are abundant in the exudate where broncho-pneumonia has occurred. The visceral pleura is from 4 to 6 mm. thick. There is often no sharp line of demarcation between this thickened membrane and the subjacent lung tissue, in consequence of a fibrosis extending into the superficial parts of the lung. This fibrosis often shows definite tubercles in close proximity to it. The thickened membrane is chiefly made up of young tissue elements consisting of connective-tissue cells, fibroblasts, and new capillaries. There is little tendency to the formation of adult fibrous tissue, and in many of the young capillaries the cells are swollen; many of the older capillaries are greatly dilated, and hæmorrhages have occurred into the surrounding newly-formed tissues. There has obviously been a great tendency for the young cells to undergo necrosis, as is evidenced by poor staining, but there is no appearance of a formation of definite focal tubercles. The surface of the membrane is ragged and is made up of shreds of necrotic material and dying cells. The whole of the thickened membrane contains enormous numbers of tubercle bacilli, especially in areas where necrosis is present, and also in the superficial parts (Fig. 3). The parietal pleura has a similar character. It may be stated that at the time of the post mortem a film of the exudate stained for tubercle bacilli showed numbers of these organisms to be present.

The *right lung* is in a similar condition to the left, but the tuberculous process is obviously more recent, there being greater evidence of tuberculous broncho-pneumonia and of very early miliary deposits. The pleural membrane in this case is not thickened.

Intestine.—In the ulcerated areas the mucous membrane has com-

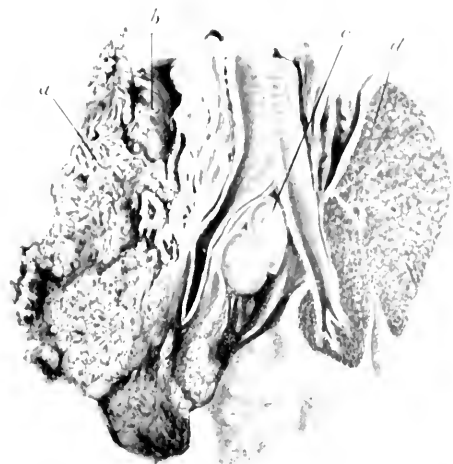


FIG. 1.—Lungs from behind. *a*, Left pleura; *b*, left lung; *c*, interbronchial caecating glands; *d*, right lung.

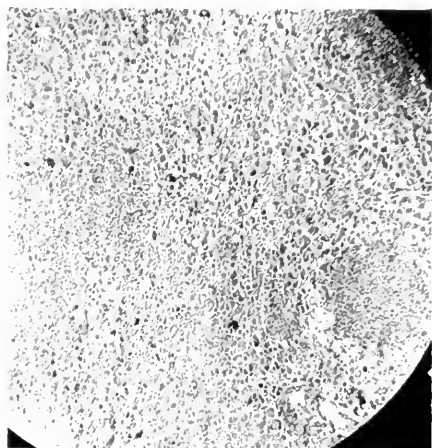


FIG. 2.—Liver, showing miliary tubercles. ($\times 450$ diam.)

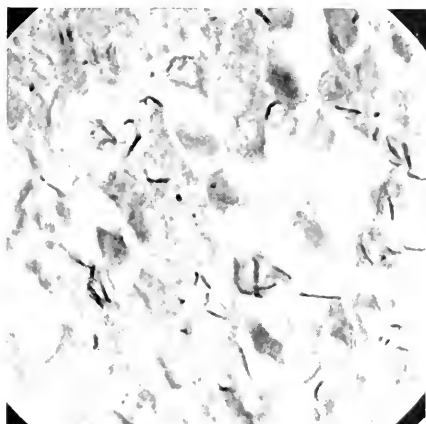


FIG. 3.—Pleural exudate with bacilli. ($\times 1000$ diam.)

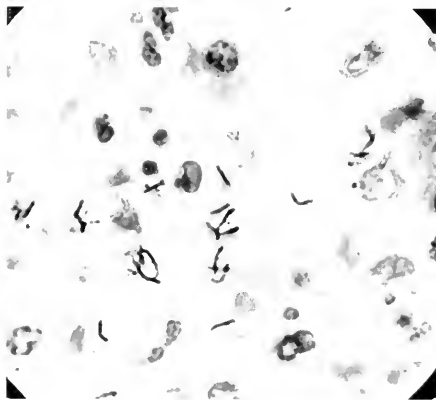


FIG. 4.—Splenic pulp containing tubercle bacilli. ($\times 1000$ diam.)



FIG. 5.—Kidney. Blood-vessel containing tubercle bacilli. ($\times 1000$ diam.)

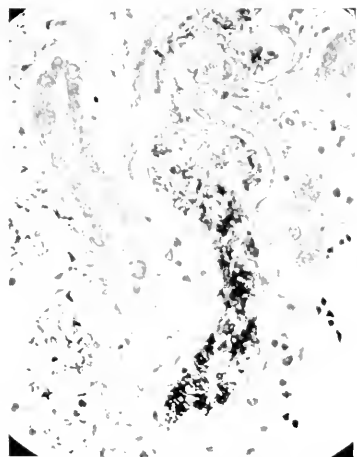


FIG. 6.—Kidney. Collecting tubules showing tubercle bacilli. ($\times 400$ diam.)

pletely disappeared, and the floor of the ulcer is formed of fairly recent granulomatous tissue undergoing necrosis. This occupies what corresponds to the deeper parts of the mucosa; the submucosa is also involved, but the muscular layers are intact. Sometimes the newly-formed tissue has a focal tendency, but generally is infiltrative in character. This infiltration involves the mucosa and submucosa neighbouring on the ulcers, and is evidenced by the presence of numerous connective-tissue cells. All the capillaries and small vessels in the ulcerated areas are much distended, and there are haemorrhages into the tissues and on to the surface of the ulcers. There are recent subperitoneal tubercles opposite the ulcers. All the tuberculous tissue in the intestine is crowded with bacilli.

Mesenteric Glands.—Some of the mesenteric glands, which to the naked eye were not breaking down, contain microscopically in the peripheral zone foci of hyaline tissue, suggestive of healed tuberculosis. No tubercle bacilli were found in these glands. A retroperitoneal gland showed a proliferation of endothelial cells, with tendency to degeneration, and contained numerous bacilli, the condition being analogous to what is seen in the spleen (*vide infra*).

The *liver* (Fig. 2) is so infiltrated with very early miliary tubercles that the normal lobular structure is masked. These tubercles are all of about the same age, and consist chiefly of young connective-tissue cells and fibroblasts. Sometimes in the centre there is a commencing breaking-down, but ordinary caseation is almost entirely absent and no giant cells are to be seen. The tubercles are distributed generally throughout the organ, and the portal spaces are not specially infected. The liver cells are fairly normal, but in places contain large fat globules; the fatty change does not appear to be specially related to the tuberculous deposits. The tubercles contain enormous numbers of tubercle bacilli. Round the granulomata bacilli are found free in the lumen of capillaries and are sometimes seen within the capillary endothelial cells.

In the *spleen* (Fig. 4) the lymph follicles, though normal, are much diminished in size; the central vessels are often hyaline. In the pulp the outlines of the sinuses are difficult to make out, the whole tissue being apparently a solid mass of cells. On close examination the appearance is seen to be due to a swelling and proliferation of the endothelial cells lining the sinuses. The nuclei of the cells are enlarged and pale-staining, the protoplasm is abundant and stains homogeneously with eosin; sometimes the cells are multinucleate. The picture generally is that of proliferation of cells with tendency to degeneration. In consequence of the endothelial encroachment on the sinus spaces the usual cellular content of the latter is scanty. There are throughout the spleen a few nodules of definite miliary tuberculosis. The whole organ is generally infected in an extreme degree with tubercle bacilli,

occurring singly or in masses. The organisms are largely extracellular, and appear to be less numerous in the lymphoid tissue than in the pulp.

Kidneys.—Glomeruli are normal, epithelium of convoluted tubules swollen and catarrhal, straight tubules fairly normal. In some of the collecting tubules there are many tubercle bacilli (Fig. 6). Some interstitial hyaline change is present in the medulla. There are a fair number of miliary tubercles scattered throughout the kidneys, and these contain tubercle bacilli. Here and there masses of tubercle bacilli were found in the lumen of the straight arterioles (Fig. 5).

The *suprarenals* seem normal except that the cortical cells are swollen. No tuberculous deposits have been observed, but a considerable number of tubercle bacilli are found scattered throughout these organs.

Heart.—The muscular tissue appears normal except for a slight increase of the cellular pigment. One very early miliary tubercle was found consisting of a small collection of connective-tissue cells; it was intramuscular in position and contained tubercle bacilli. Some masses of bacilli were also found within small blood-vessels.

Isolation of Bacillus.—The tubercle bacillus was isolated from the pleural membrane by Dr. C. Y. Wang. In primary cultures its characters correspond with those of the human strain.

DISCUSSION.

The outstanding features of this case which require discussion are the presence of caseous and calcified mediastinal glands, the tuberculosis of the lungs, the tuberculous pleurisy, the intestinal ulceration, the miliary tuberculosis of the liver, the condition of the spleen, the evidence of tubercle bacilli within the circulating blood, and the terminal intestinal hæmorrhage.

The earlier progress of the disease can be most easily followed. The tubercle bacilli had entered the body by the respiratory path, had passed through the bronchial mucous membrane—possibly carried by leucocytes—and had been deposited in the interbronchial glands. From the size of the lesions here we judge that the pathological process had been slowly progressive, and the existence of calcification indicates that infection had taken place a considerable time before death. While this primary lesion would not originate any physical sign it might well account for the neurasthenia from which the patient suffered. Chronic latent tuberculosis causes subtle impairment of every function. In the present case the patient occupied a responsible position, requiring sustained mental effort, and thus his psychological centres tended to fail. He became neurasthenic and sleepless. Further, his appetite was bad and he suffered from vasomotor disturbance—conditions both common in tuberculosis. The ordinary form which the

second of these takes in the disease is the occurrence of nocturnal perspirations, but unusual feelings of heat and cold locally in the body are by no means rare. The patient in the autumn reported an improvement in health, but this may have been an example of the "spes phthisica." To judge from the post-mortem appearances the tuberculous process was probably advancing; the ebb and flow of the lymph to and from the affected glands to the left lung had carried the bacilli into the interstitial tissue and interlobular septa, and granulomata had thereby originated in the left upper lobe, and probably had infected the pleura. At first the process was slowly progressing and there was a tendency to healing as is shown by the fibrosis and capsulation. Taking into account that the patient was of an age when susceptibility to tuberculosis is diminishing, the condition might now have gone on to chronic phthisis and even to ultimate recovery. At this point, however, unfortunately for the patient, he contracted influenza, a common secondary effect of which in a tuberculous subject is, as the phrase goes, to break down any resistance the body may be offering to the tubercle bacillus. This undoubtedly took place, but the interpretation of the post-mortem observations now becomes very difficult, for the loss of resistance presents several rare features, and we have not sufficient data for stating the sequence in which these manifested themselves. To this stage the pleural condition belongs, and likewise, in all probability, the intestinal ulceration and the infection of the right lung. Tuberculous pleurisy ordinarily is a very chronic condition of fibrotic thickening of the membrane with effusion, going on for many months without very serious effect; the effusion may even be beneficial from the rest and opportunity for healing it gives the lung. In the present case there was a rapidly progressing, general, non-focal granulomatous condition of the whole membrane of an unusually vegetative character. Often the most careful search fails to reveal the tubercle bacillus; here their presence was, at the end, evident in a microscopic film of the effusion, and, what is very rare, the membrane was teeming with them. The intestinal ulceration, to judge from the microscopic appearances, was not of long standing, and its occurrence thus early in pulmonary tuberculosis is unusual. Ordinarily it commences comparatively late in a chronic phthisis, when tubercle bacilli have been swallowed it may be for years. Here the intestinal infection must have started whenever the breaking-down of the left apex liberated bacilli into the sputum. It is probable also that at this time the infection of the right lung took place, and, what is always a sign of lowered resistance, tuberculous broncho-pneumonia appeared. The patient was, during the latter weeks of his life, in a most critical condition. The fact that the left pleura contained pints of what was really a fluid culture of the tubercle bacillus was in itself a serious menace to life, both from the opportunity for fresh infec-

tion with living bacilli presented, and from the possible absorption of the toxins they were producing. There is evidence that both factors operated towards the fatal result. In this connection the condition of the liver now claims attention. It is difficult to date the age of a tuberculous lesion, but from experimental data we would judge the miliary condition in the liver to have been due to a showering of bacilli upon it from the blood about a fortnight before death. Whether these came from the pleural focus or from the intestinal ulcers it is impossible to say, but to the same period probably belong the miliary lesions in the kidney, the spleen, and the right lung; the fact that the condition was chiefly marked in the liver might point to a source either in the intestine or in the secondary glands which were present. Through the liver lesions a vicious circle was established, for from them, as the microscopic evidence shows, there were poured into the liver-capillaries myriads of bacilli. Whether or no this was the sole or only a contributory source, there was now established the excessively rare condition of a tuberculous septicæmia, in which, by ordinary methods, large numbers of bacilli could be demonstrated in the blood. It is an important fact that while the bacilli were distributed throughout the body, as is shown by their being detected in the kidney, suprarenal, and heart, they were specially retained in the spleen. Here, probably only a few days before death, they originated an excessively rare condition of general proliferation and degeneration of the endothelium of the pulp; a similar condition was observed in a retroperitoneal lymphatic gland. There is one more striking phenomenon presented by this case. Severe hæmorrhage from a tuberculous intestinal ulcer is uncommon; simultaneous hæmorrhage from a number of such ulcers must be due to some very unusual cause. We believe that in the present case it may be traced to the occurrence of what was to all intents and purposes a tuberculin reaction. The most likely source of this is the pleural effusion, the partial removal of which, in the days preceding death, may have caused a tendency to absorption. This might come about in two ways. Either (1) the decrease in the tension of the fluid mass may have enabled the weight of the chest during expiration to force more fluid into emergent vessels previously pressed on or kinked; or (2) a partial re-expansion of the lung may have caused fluid to be sucked into it to relieve the elasticity during inspiration. Whatever the cause, the action of the tuberculous poison on the young vessels in the intestine would cause the expansion and rupture of these noticed microscopically; the condition is comparable to what was formerly occasionally seen in the lung when what are now known to have been excessive therapeutic doses of tuberculin were injected in cases of pulmonary tuberculosis. The loss of the blood found post mortem in the intestine acting on an individual profoundly debilitated by a multiplicity of tuberculous lesions may

have been sufficient to cause the sudden collapse which resulted in death.

The case is thus of great interest. The widespread distribution of the acute lesions and the fact that they developed during the last four weeks of life are remarkable; the condition of the pleural membrane and of the spleen, the tuberculous septicæmia and the intestinal hæmorrhage, are features of great rarity.

Acknowledgments are due to Dr. Harry Rainy and Mr. J. W. Dowden for the clinical notes, to Dr. James Miller who performed the post mortem, and to Mr. Richard Muir for the illustrations.

JAMES RITCHIE.

THE GREAT DUTCH PATHOLOGIST AND PHYSICIAN, HERMANN BOERHAAVE, 1668-1737: A RETROSPECT.

WHILE still a student in the University of Edinburgh the compiler of the following notes and extracts was very familiar with the name of Boerhaave. Indeed this great name was rarely out of the mouth of the then Professor of Pathology, Professor Sanders. To his class Boerhaave was always held up for the admiration of the scientific-minded student. After more than forty years of medical practice the early impressions on head and heart have returned to the writer with the desire to reproduce much that our esteemed professor endeavoured to instil into his student audience.

The three sources from which information regarding Boerhaave have been culled are:—(1) *The Gentleman's Magazine*, 1739; (2) *The Life of Boerhaave*, by Dr. William Burton of Yarmouth, 1746, published 9 years after Boerhaave's death; and (3) an article by the Editor of the *Transactions of the Royal Society*, 1736.

The pages and chapters are carefully indicated so that the student may be guided in his further study of the life, character, and scientific attainments of the great physician, a star of the first magnitude in his day.

HERMANN BOERHAAVE.

According to Burton, it appears that ever since the rise of the Athenian Commonwealth the sciences have flourished most during a republic—witness that of the Dutch Republic. It may be difficult to give outstanding names, but none has been more universally celebrated than that of Dr. Hermann Boerhaave, Professor of Physic in the University of Leyden. He was born

in the year 1668 on the last of December about one o'clock in the morning. The principal biography of this great man was accidentally burned. Many minor accounts of his life have been supplied by his grateful countrymen, by physicians, lawyers, and divines, so that much is known of his life and character. His father was the Rev. James Boerhaave, minister of a small village, Voorhant (about a mile distant from Leyden), a name great in the memory of the scientific from its association with the great physician. His father, who excelled in the knowledge of Latin, Hebrew, and Greek, was married to a lady of Amsterdam, the daughter of Hermann Daelder, an ingenious artificer, especially in matters connected with navigation. This lady's genius and delight in physic was such that she became really skilled in it; but, whatever may be ascribed to the inheritance of genius, her son's education owed little to her influence—she died when he was but five years old. The Rev. James Boerhaave was always anxious that his son should follow his own profession, but the youth, though deeply religious, could not give up his favourite study of medicine. In his twelfth year a malignant ulcer in his left thigh, eluding the art of surgery, and occasioning such excessive pain as greatly retarded his study, caused him to concentrate his attention on the cure of disease.*

In 1682 Boerhaave was sent to Leyden for the benefit of his health and for university education. Six months later he had the misfortune to lose his father, but one of the professors of divinity, Mr. Trigland, undertook his education, and quickly recognised the quality of his intellect and the virtues of his character. In 1690 he took his degree in philosophy. The subject of his thesis was "The Distinct Natures of the Mind and Body." In this performance, by strength of argumentation much superior to his years, he subverted the systems of Epicurus, Hobs, and Spinoza. He soon became master of the Greek, Hebrew, and Chaldean languages, and, rejecting translations, conversed only with originals. His friendship with Spinoza at one time produced the impression that he had atheistical tendencies, which detracted from his influence in the University, but he soon outgrew this slander.

* "In his 12th year Dr. H. Boerhaave was unhappily afflicted with a malignant ulcer in his left thigh, with acute arthritis, eluding the art of surgery and occasioning such excessive pain as greatly interrupted his studies for 5 years together; but at length, after all the vain efforts of physicians, he himself, by fomenting continually with salt and urine, effected a cure, and thereupon conceived his first thoughts of studying physic."—Burton, part i. page 6.

Boerhaave continued to lecture at Leyden until the year 1701, when, by the importunity of his friends (for his modesty made him at first oppose the movement), he was persuaded, on the death of Professor Drelincourt, to take the office of lecturer upon the institutes of physic. Whereupon he delivered an oration on the 18th May, the subject of which was a recommendation to the students of the study of Hippocrates. The character he drew of the old physician was so like his own that the one might be taken for the other.* In 1703 he became one of the Professors of the University of Gröningen. His address on this occasion dealt with the importance of the healthy condition of the circulation for both mind and body.

In 1714 he was raised to the highest dignity of the University of Leyden, namely its Rectorship. Again he lectured on Hippocrates, explaining Hippocrates by Hippocrates. At this time he was also appointed President of the Surgical College. Altogether he was a man of much domestic felicity and public usefulness. He freely acknowledged that he owed all to the grace of God. He died 30th September 1738 in his 70th year, in much composure.

EXTRACTS.

1. From *The Gentleman's Magazine*, 1739.

His father, James Boerhaave, was Minister of Voorhaut. His son says he was of a very amiable character. For the simplicity and openness of his behaviour, for his good frugality in the management of a narrow fortune, and the prudence, tenderness, and diligence with which he educated a family of nine children. His mother was Vagan Daelder, a tradesman's daughter, of Amsterdam, from whom he might perhaps derive an hereditary inclination to the study of Physic, in which she was very inquisitive, and had obtained a knowledge of it not common in female students. This knowledge, however, she did not live to communicate to her son, for she died in 1673, ten years after her marriage. The father sent him to the fields, intending him for the Ministry. In his twelfth year he put away all his prescriptions and effected a cure upon himself with salt and urine. At length his propension to the study of Physic grew too violent to be resisted, and though he still intended to make Divinity the great employment of

* "The great and good Boerhaave used to say that the poor were his best patients, for God was their paymaster. But everybody is not as patient nor so deserving; so that the rich, though not perhaps the best patients, are good enough for common practitioners. I suppose Boerhaave put up with them when he could not get poor ones, as he left his daughter 2 millions of florins when he died."—Oliver Wendell Holmes *Elsie Venner*, page 14.

his life, he could not deny himself the satisfaction of spending some time upon the Medical Writers, for the perusal of what he was so well qualified by his acquaintance with Mathematics and Philosophy. He at length determined wholly to master this profession, and to take his degree in Physic before he engaged in the duties of the Ministry. He was one of those mighty geniuses to whom scarce anything appeared impossible, and who thought nothing worthy of his efforts but what appeared insurmountable to common understanding. Finding, as he tells us himself, that Hippocrates was the original source of all medical knowledge, and that all the later writers were little more than transcribers from him, he returned to him with more attention, and spent much time in making extracts from him and digesting his treatises into method and fixing them in his memory. Boerhaave desired a licence to preach, and intended in his theological exercise to discuss the question "Why so many were formerly converted to Christianity by illiterate persons and so few at present by men of learning." In pursuance of this plan he went to Hardewich in order to take the degree of Doctor in Physic, which he obtained in July 1693, having performed a public disputation *de utilitate explorandorum excrementorum in Aegris, ut signorum* (p. 73). Then returning to Leyden full of his previous design of undertaking the Ministry, he found to his surprise unexpected obstacles thrown in his way, and an insinuation dispersed through the University that made him suspected not of any slight deviation from received opinion, not from any pertinacious adherence to his own notions in doubtful and disputable matters, but in no less than in his friendship with Spinoza, or, in plain terms, with Atheism itself.

The most eminent man at the University of Leyden, and who made a great epoch in its annals, was Hermann Boerhaave, the general oracle of Medicine. Linnaeus had particularly wished to see and converse with him, but it was in vain. Indeed there was no room for surprise at his disappointment. No minister could be more overwhelmed with entreaties and invitations, nor more difficult in granting an audience than Boerhaave. His menial servants reaped advantages from this circumstance, for there an audience was always a profitable money job. By the weight of gold it could alone be accomplished; without a *douceur* it was hard for any stranger or foreigner to gain admittance. Linnaeus was quite unacquainted with this method, and had it not in his power to make presents. Owing to Boerhaave's infinite occupation and the strict regularity which he observed, Ambassadors, Princes, and Peter the Great himself was obliged to wait several hours in his ante-chamber to obtain an interview. How much more difficult must it have been for the young Northern doctor, Linnaeus, allowing him his usual spirit of liberality, to aspire at the honour of admittance. Notwithstanding all these obstacles he obtained it at last.

In his last illness, which was to the last degree lingering, painful, and afflictive, his constancy and firmness did not forsake him. The dejection and lowness of spirits was, as he himself tells us, part of his distemper, yet even this in some measure gave way to that vigour which the soul received from a consciousness of innocence.

He married in September 1710 Mary Drogenveen, the only daughter of a Burgomaster of Leyden, by whom he had Joanna Maria, who survived her father—1739—and three other children who died in their infancy.

The Editor of the *Gentleman's Magazine*, 1739, says (regarding his writings): "These are the writings of the great Boerhaave, which have made all encomiums useless and vain, since no man can attentively peruse them without admiring the ability and reverencing the virtues of the author" (*G. M.*, 1739). Such was his fame that a letter sent from China and directed to "The Illustrious Boerhaave, Doctor in Europe," safely reached him (p. 77). Extremely active and plain, he was in other respects a downright Dutchman. His whole wardrobe consisted of a couple of suits, which he used to wear till they became threadbare. His Dutch-built stature, his old shoes, his loose hair, and the large crab stick which he had always with him made him pass for some person of low description, though he was one of the richest individuals in Leyden. He was, however, extremely beneficent to the poor.

About three weeks before his death he received a visit at his country house from the Rev. Mr. Scultens, his intimate friend, who found him sitting outdoors with his wife, sister, and daughter, contemplating the wonderful and inexplicable union between soul and body which nothing but long sickness can give. The daily miracles of Nature greatly possessed his soul. He was tall and remarkable for extraordinary strength. There was in his air and motion something rough and artless, but so majestic and great at the same time that no man ever looked upon him without veneration and a kind of tacit submission to the superiority of his genius. The vigour and activity of his mind sparkled visibly in his eyes, nor was it ever observed that any change in his fortune or alteration in his affairs, whether happy or unfortunate, affected his countenance (p. 174).

2. From Dr. William Burton.

The study of medicine commenced with that of anatomy. Boerhaave, accordingly, diligently perused Vesalius, Fallopius, and Bartholin, often times dissecting brutes alive with his own hand, and attending the public dissections of Professor Nuck: nay, the very slaughter-houses did not escape him, wherein he confessed many useful observations had occurred to him, so far was he from yielding an implicate faith to authority, or from declining the irksome but profitable labour of dis-

secting and exploring bodies with his own hands and eyes, alike qualified with patience to observe, and fidelity to deliver, the dictates of Nature.

Thus grounded, he next applied himself to the fathers of physic, beginning with Hippocrates, and in their chronological order read carefully all the Greek and ancient Latin physicians. But soon finding that the later writers to the middle of the fifth century were almost wholly indebted to that prince of physicians for whatever was valuable in them, he resumed Hippocrates, to whom alone in this faculty he devoted himself for some time, making excerpts, and digesting them in such a manner as to render those inestimable remains of antiquity quite familiar to him. Afterwards, with less difficulty, he became acquainted with the most authentic modern authors, and singled out that second Hippocrates—Sydenham—whom, after frequent repetition, and always with additional satisfaction, he usually stiled the IMMORTAL SYDENHAM (p. 15).

On 8th August 1714 he was constituted Professor of the Practice of Physic at Leyden in the room of Bidloo, when twice a week he attended the university hospital, not less to the advantage of his pupils than of the patients; an hospital was hitherto wanting to furnish him with proper subjects for improving the science by new attempts in desperate cases; for the experience was not small which he had already obtained from an extensive practice of many years joined with the advantage which physicians in Holland have over some of their neighbours, who are seldom called to the assistance of their patients before the middle or near the end of their distempers, whereas the Dutch physicians, by being usually consulted at the very beginning, often prevent the ill effects which the disease, left to itself or injudiciously treated, is too commonly accompanied with; and at the same time they have an opportunity of instructing themselves by observing the nature of the distemper in its several periods. The curators of this university, being apprized how necessary it is for the young physician to be led by one already versed in practice to the bedside of the sick, before he ventures by himself to undertake the cure of diseases, have very wisely instituted this hospital entirely subservient to the use of the university, to which it is as essential an ornament as the anatomical theatre, chemical laboratory, physic garden, or the public libraries. At this hospital the professors of physic are obliged to attend three months in their turn, and the students of the university have liberty to visit the sick: and in case patients die of any extraordinary distemper, the hospital is provided with a convenient amphitheatre, where the necessary dissections are made with the greatest accuracy and decency, notice being always given to the students to attend. Many remarkable cases that occurred under Boerhaave's care in this hospital are preserved in manuscript by some of his pupils (p. 33).

How often he extolled that honest and discreet medical simplicity too rarely found, and condemned that licentiousness of asserting and framing hypotheses, and disputing with the subtlety of reason only, so destructive of the art, to the neglect of its faithful mistress, experience, and the converting the dictates of Hippocrates, *i.e.* of Nature, into the baneful fictions of those idle and ignorant men who have presumed to practise and teach physic without a tolerable acquaintance with the animal economy, distempers, or remedies, and indeed the less their knowledge the greater their pretensions. He had the true way of explaining Hippocrates by Hippocrates, and the operations of the body also, not by fictitious but demonstrable anatomical principles, of enlarging the materia medica and the science of the ancients by recent discoveries, with great caution and justness. How well did he dictate the method whereby diseases were distinguished and removed. His doctrine was sound and certain, as founded on observation, confirmed by experience, and absolutely impartial, as attached to no sect. Wonder not therefore so many resorted hither for instruction from all parts of Europe. To the publick welfare he sacrificed his own, but never busied himself impertinently. He was neither full of himself nor a disparager of others, and so far from insinuating anything to the diminution of his colleagues, that he recommended to his pupils an attendance on their lectures (p. 43).

His eighth and last oration he delivered on February 1731 on laying down his Rectorship a second time. Honoured as he was by the dignity of this office, he became more so by his administration of it. In this oration he demonstrates that a real servitude to Nature in observing her dictates and following her example is the sole foundation of merit, entitling a physician to the highest honours in his profession; that the art of healing is never more successful than when directed by Nature, being but her faithful servant. But what is Nature? By this, for fear of misconstruction, he afterwards declares himself to mean that chain of causes and effects which ultimately terminate in the sovereign cause and director of all things! That without instructions thus acquired, the most learned and ingenious artist is unable to explain the formation of the parts and the functions of the animal economy. Notwithstanding all their pretensions by artificial digestions and separations to parallel the productions of Nature the most consummate adepts cannot from bread and wine or other human aliment prepare one drop of blood, which Nature effects so speedily and constantly; nay, they cannot regenerate blood by any commixture of the very parts into which they had separated it by their art, so much is sanguification and nutrition the work of Nature only. Upon a knowledge, therefore, of her laws and a conformity to them, the success in regulating her motions and redressing her maladies must depend (p. 45).

The ancients emblematically represented labour as the vestibule to the temple of honour. Boerhaave found it really so, than whom none lived more laborious, none more respected. This was apparent not only from the multitudes which daily resorted to him for relief, but from the letters he was continually receiving from all parts of Europe to consult him in difficult cases for persons of all ranks up to crowned heads, so unjust was the insinuation that he had but little experience.

The love of liberty and his country induced Hippocrates to refuse the most magnificent emoluments offered him by Artaxerxes—to reside at his court in consort with men of the greatest abilities that power and wealth could command from all parts of the world; for the same reason Boerhaave also declined invitations of the like nature. Instead of attending princes abroad, he seldom failed of receiving visits at home from those who had occasion to pass through Leyden. Among many personages of high distinction, two only are mentioned in the funeral oration, but two such princes as every age is not blest with—the present Grand Duke of Tuscany, and that genius for civil polity and universal science, Peter the Great, late Czar of Muscovy, who did not repent lying all night in his pleasure barge against Boerhaave's house in order to have two hours' conversation with him on various points of learning the next morning before college time (p. 48).

His deviating once from a state of submission gave him great concern. When racked with incredible torture for fifteen hours successively, he earnestly prayed the disease might put an immediate period to his life and misery; and upon his friend's suggesting by way of consolation that a request so circumstanced was not only natural to human frailty, but preceded by Job himself, he replied, "This maxim, however, I wish to abide by living and dying, 'that only is best, and alone to be desired, which is perfectly agreeable both to the Divine goodness and majesty.'" Consonant to this truly Christian humility was that reflection of his, "Many who make the greatest profession of Christ's doctrine pay little deference to His example, recommended in one of His first precepts, 'Learn of me, for I am meek and lowly in heart.'" He was constant in private devotion, morning and evening, and through his whole life consecrated the first hour after he rose in the morning to prayer and meditation, and not only declared he thence derived vigour and an aptitude for business, but recommended the same practice to others. To this alone he attributed the conquest he had gained over the irascible passions, when a friend seeing him unmoved by great provocations, asked whether it was by art or nature he maintained such equanimity? He was as constant at public worship as his affairs would permit.

But his piety towards God, however extraordinary, did not exceed his regard to his neighbour, for his tongue and heart corresponded in this, his frequent declaration, that "by goodness we make the nearest

approach to the nature of the Deity." This principle reduced into practice was productive of that true fortitude of mind which enabled him to overcome evil with good, and, instead of meditating revenge, to preserve even those, if such could be, that wished his destruction. In a word, his philosophy was not a superficial decoration, but was intrinsically rooted in the man, a second nature almost connate with the first.

Although soon after his marriage he gradually declined visiting patients, he was always ready day and night in attending those who were his patrons or patients at his entrance on practice, or any of their relations. In friendship he was sincere, constant, and affectionate; a man more communicative without conceitedness, more dispassionate in contending for truth, and more averse from censure, no age has produced. So unmoved was he by detraction as to say, "The sparks of calumny will be presently extinct of themselves unless you blow them; and therefore in return choose rather to commend the good qualities of his calumniators (if they had any) than to dwell upon the bad." In council and consultations no man was more condescending and desirous to cultivate concord; he was more apt to distrust than another to confide in himself. In medical consultations he was remarkable for his address towards senior physicians and his courtesy to the rest. He never made his own works or affairs the subject of discourse, and his reply to any question concerning them manifested a regard solely to the benefit of the enquirer, without sounding or seeking his own praise, whilst his good nature often led him to exceed in the praise of other authors. In the administration of justice, as during his Rectorship, he had no respect of persons, nor was ever awed into unworthy compliances by the frowns of the great; he was modest without meanness, and steady without rudeness. He held conscience the supreme court of judicature, and neither swerved from justice himself, nor connived at any deviation in others (p. 55).

It cost him much more to nourish his mind than his body. He was negligent of dress, and in his gait and deportment there was an honest and somewhat awkward simplicity, but yet accompanied, which is very rarely seen, with a distinguishable dignity. He had a large head, short neck, florid complexion, light brown curled hair (for he did not wear a wig), an open countenance, and resembled Soerates in the flatness of his nose and his natural urbanity. His eyes were small, but very lively and piercing. A cheerful serenity dwelt in his countenance, agreeing in this respect also with the wise Grecian's, that it never seemed much elated by joy, nor depressed by sorrow, an indication of that tranquillity of mind which is the agreeable attendant and guard of virtue.

The mornings and evenings he devoted to study, the intermediate part of the day to domestic and public affairs. He used to rise during

summer at four in the morning, and at five in the winter, even in his later years; ten was his usual bed-time. In the severest winters he had neither fire nor stove in his study, where he passed the three or four first hours of the morning. His application to study was greater in the last ten years of his life than in any space of equal duration from the year 1700. When business was over he took the exercise of riding or walking, and when weary revived himself with music, his most delightful entertainment, being not only a good performer on several instruments, particularly the lute, which he accompanied also with his voice, but a good theorist likewise in the science, having read the ancient and best modern authors on the subject, as appears by the lectures he gave on sound and hearing; and during the winter he had once a week a concert at his own house, to which by turns were invited some select acquaintance of both sexes, and likewise patients of distinction from other countries.

In the latter part of his life his chief pleasure was in retiring to his country seat, where he had a garden of near eight acres, enriched with all the exotic trees and shrubs he could possibly procure that would flourish or live in that climate and soil. So intent was he upon stocking it with the greatest variety, that he stiles a present of American shrub seeds "*munera auro cariora*"—gifts more precious than gold, and that of two cedar trees "*regali beare dono*"—a royal benefaction. Thus the amusement of his youth and later years was of the same kind—the cultivation of plants—an employment coeval with mankind, the first to which necessity compelled them, and the last to which, wearied with a tiresome round of vanities, they are fond of retreating, as to the most innocent and entertaining recreation. Certain it is, in the vegetable kingdom we are furnished with the greatest variety; but what redounds not less to its praise, the culture of it seems to have introduced us into all other knowledge (p. 64).

- (3) From the Translator of the *Transactions of the Royal Society* into French, by Way of Note to Boerhaave's Last Paper on "Merenry," 1736, No. 434, p. 242.

A summary view of the character of our great physician is given by an impartial hand. This great man is departed, to the irretrievable loss of philosophy and physic. Long was he the oracle of his faculty and the physician of all Europe; never was preceptor more beloved, professor more celebrated, nor physician more consulted. He arrived to an eminence in all the several branches of medicine, had the glory of teaching them with equal applause, and the happiness of seeing himself admired without being obnoxious to the effects of envy or to any disparaging contradiction, insomuch that he was never mentioned by the greatest of his contemporaries but with encomiums. His sole authority without the support of arguments was admitted as decisive.

He was not less successful in practice than learned in theory, and is therefore stiled the Batavian Hippocrates. The qualities of his mind have rendered him still more amiable than those of his understanding. He was a sure patron to men of learning and genius, employing his own reputation as it were wholly for their service. We may add he was a man of a vast comprehension, profound judgment, prodigious memory, solid experience, and unparallel'd modesty. His religion, though strict, was rational; he sought truth constantly, espoused it zealously, and on his labours mankind may securely rely. He was faithful and civil to his very enemies; his skill not only in philosophy and physic was revered by all who excel in those studies, but his attainments in other learning excited admiration. His knowledge had a right influence upon the temper of his mind, which was endowed with all the humility, benevolence, fortitude, and sincerity of a sound and unaffected philosopher. To conclude our account of his life with the words of a very polite biographer—"This is spoken not of one who lived long ago, in praising of whom it were easy to feign or to exceed the truth where no man's memory could confute us, but of one who is lately dead, who has many of his acquaintances still living that are able to confirm this testimony, and to join with us in delivering down his name to posterity, with this true, though imperfect, character of his learning and virtues" (p. 75). H. M. C.

OBITUARY.

SIR THOMAS CLOUSTON, LL.D., M.D., F.R.C.P.E.

THE announcement of Sir Thomas Clouston's death suggests many reflections. He was a prominent citizen of Edinburgh, a specialist of world-wide reputation, and a man whose *mens conscia recti* stood revealed to the most casual observer. Like many other Scotsmen, he owed his success in life to his native grit alone. But there are probably as many means of attaining success as ends to be gained—some more admirable, others less so. Clouston's path to success was of the admirable order, for he sailed into it buoyed up by high ideals which sustained him to the end.

Born seventy-five years ago in Orkney, he loved his native islands and was proud of his Norse descent, whence he probably inherited his independence of character and love of freedom. In the middle of last century the writings of men like Green, Carlyle, and Matthew Arnold taught—or at any rate seemed to teach—that the future of Europe belonged to the Teutonic races, so much so that after the war of 1870 "German" became synonymous with progress and "Celts-Latins" with decay. Clouston naturally was an adherent of these opinions,

and to his most intimate friends it was apparent (although the subject was never referred to) that the circumstances of the present European crisis produced in him, as in many others, a reversal of these cherished beliefs.

From the Grammar School of Aberdeen, which turned out many famous men, he proceeded as a medical student to the University of Edinburgh. A man of his attainments would probably have distinguished himself at any school, but he often used to speak of the influence of his teachers—Goodsir, Syme, Simpson, and Laycock—who formed a galaxy of genius, which probably no medical school ever possessed at one and the same time. It would have been impossible for any man—Clouston least of all—to have passed through this constellation without illumination. As might have been expected, he spoke most of Laycock; but whether Laycock gave his mind the bent towards the study of mental diseases, or whether, because of his natural inclination, he was drawn towards a kindred spirit, it is difficult to say. It is significant of this early tendency that his thesis for the degree of M.D., for which he received a gold medal, was upon the nervous system of the lobster.

From the University he went straight to Morningside as assistant to Dr. Skae, whom he regarded as a man of great originality and prolific in ideas. He remained at Morningside for upwards of two years, when, at the extremely early age of twenty-three years, he was appointed Superintendent of the Cumberland and Westmoreland Asylum, Carlisle. There he remained for ten years, assiduously pursuing clinical research. These researches were not confined to any special subject, but included a variety of observations, clinical, pathological, and therapeutic. His inquiry into the bodily temperature in various forms of insanity, carried out before the invention of the self-registering thermometer, is, though negative in certain aspects, regarded as a standard investigation which it has never been necessary to revise. The value of sedatives in the treatment of excited conditions was also carefully worked out and established. Finally, the naked-eye appearances of the brain and the grosser pathological changes in different forms of insanity attended by vascular disorders or degeneration were carefully recorded. These are a few illustrations of the kind of activity which absorbed his energies as a young physician.

Just before his death and before Clouston's appointment to succeed him, Skae had begun to deliver the Morison lectures, containing his famous somatic classification of insanity. Clouston finished the course and loyally identified himself with the views of his late chief. How far he really accepted Skae's views it is impossible to say, for although everyone will be prepared to admit that a plausible basis exists for a somatic classification, probably no one will be prepared to admit that it forms a working clinical hypothesis. When, ten years later, he

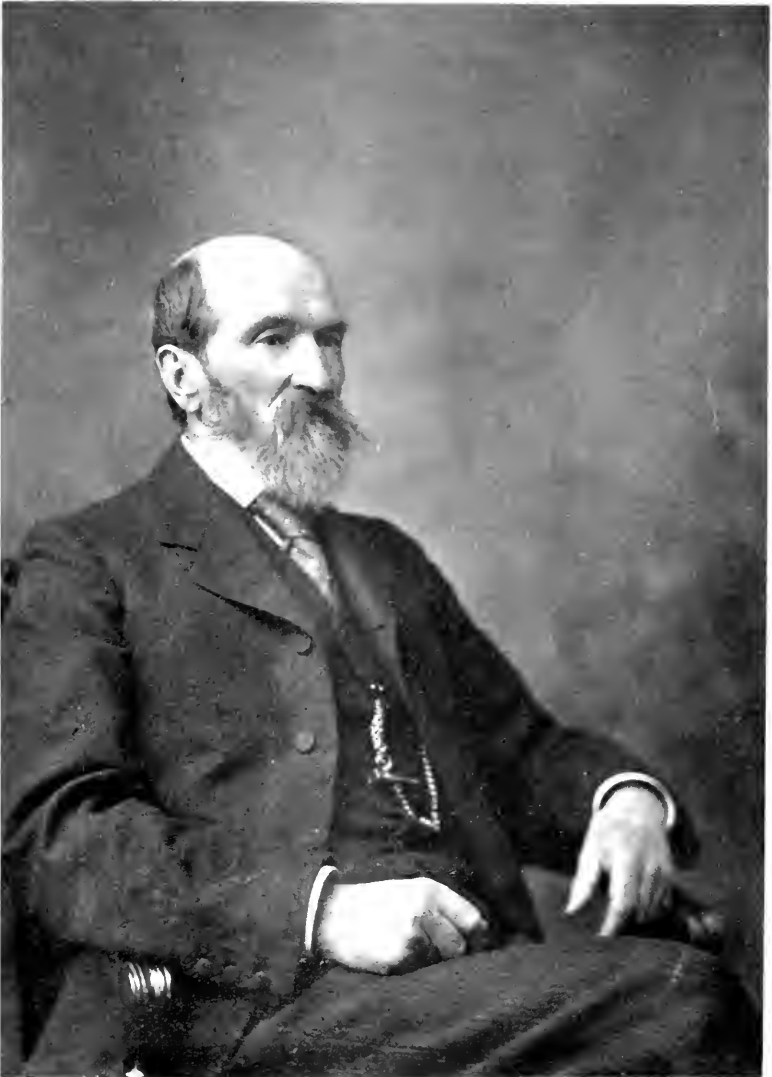


Photo. J. P. Co. (1841)

SIR THOMAS CLOUSTON.

published his clinical lectures, Skae's classification, though still presented, found only a subsidiary place, having been extruded by the exigencies of more modern views. The mere fact of its reproduction, however, is a typical example of the loyalty to persons and to opinions which characterised his whole life. He never deserted a friend and seldom relinquished an opinion. The writer well remembers the conflict over the toxic origin of insanity. Clouston championed the view of the inherent liability of the nerve-cell to become unstable and to cause secondary disturbances of metabolism with the consequent production of toxins. The younger men pointed triumphantly to general paralysis, alcoholism, pellagra, and certain puerperal conditions in proof of the primary *role* of toxins in inducing mental affections. For long he was unmoved, but at last he yielded reluctantly so far as to admit that in predisposed persons a vicious circle might be established by the introduction or formation of toxins in the system. The controversy rests there for the present, but it will probably be again revived in the same or some other form.

In estimating the value of Clouston's work, we must place him along with Magnan and Kraepelin as a representative alienist of our day. His original description of adolescent insanity would of itself entitle him to this rank, and his masterly conception of the insanities as illustrated in his lectures and writings amply justify the claim. In making this statement it has to be borne in mind that he was a propagandist in all his work. Whether he was lecturing to students or to the public or writing on his special subject, the purpose of influencing his audience to think along lines which he considered beneficial was never absent from his mind. Hence, from a purely scientific standpoint, he was frequently misunderstood, and his work was often underestimated. The best part of his work has, however, been incorporated into the teaching of psychiatry, and will always remain associated with his name.

In the onerous task of managing a large institution he owed much to a copious fund of common sense and natural shrewdness. He was scrupulously conscientious in the performance of all routine duties, with which he never allowed the numerous calls of a large consulting practice or social engagements to interfere. Above all, his administrative views were broad, and where other men, less gifted in outlook, would be liable to become distracted by details and trivialities, he was able to grasp essentials. This was well illustrated in the planning and building of Craig House (the new department of the Royal Edinburgh Asylum for the accommodation of private patients), which, taken as a whole, could only have been conceived by a man of large mind.

After thirty years of office as Physician-Superintendent of the Royal Edinburgh Asylum, he retired into private life in 1908 in his sixty-fifth year. His assistants, past and present, took the opportunity of making

him a presentation, which took the form of a Norse galley in chased silver, a gift which he highly appreciated. At the dinner at which the presentation was made, and to which no strangers were invited, a large and goodly company was present. Shortly afterwards his friends and admirers—of whom no man can hope to possess more—presented him with his portrait, painted by Mr. Fiddes Watt, R.S.A. Other dignities were bestowed upon him, including the honorary degree of LL.D. by the Universities of Aberdeen and Edinburgh, and the honour of knighthood by the King on the occasion of His Majesty's visit to Edinburgh in 1911.

In his domestic life he was fortunate in the devoted support of Lady Clouston (who survives him) during the strain of his more active professional career. It is interesting to add that they celebrated their golden wedding last year. Their only daughter is the wife of Mr. David Wallace, C.M.G., and of their two sons, the elder, Mr. J. Storer Clouston, is the well-known novelist and writer.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., J. D. COMRIE,
M.D., AND ALEX. GOODALL, M.D.

NEW TEST IN SYPHILIS OF THE NERVOUS SYSTEM.

GORDON (*New York Med. Journ.*, 20th February 1915) makes a preliminary communication as to a test which he has found of value in the diagnosis of cerebro-spinal lues. The test does not pretend to compete with the reaction of Wassermann, but is the result of an attempt to find some biochemical reaction of a simple nature which may be utilised by the practitioner. The test is carried out as follows:—0.5 c.c. of blood-serum is placed in a test-tube and five drops of a 1 per cent. solution of perchloride of mercury are added to it, being allowed slowly to fall into the centre of the tube. In the case of a healthy serum, or serum free from syphilis, the following change occurs:—As soon as the reagent comes in contact with the serum a cloudiness appears which will rapidly increase in density, so that at the end of five minutes or more the entire amount of serum will present a thick grey mass with a slightly greenish tinge; furthermore, if this be kept overnight the coagulum falls to the bottom of the tube, leaving a clear fluid above it. A syphilitic serum, on the other hand, gives only a foamy upper layer of contact coagulum, the serum beneath remaining clear; while if the tube be left overnight, this slight coagulum is redissolved. This applies to syphilis generally,

irrespective of the organ involved. The cerebro-spinal fluid, on the other hand, from a normal case, remains clear, and that from a case of syphilis of the nervous system becomes slightly cloudy, when it is similarly treated with the same reagent.

TUBERCLE BACILLI IN THE URINE.

Some interesting facts regarding the discovery of the tubercle bacillus in the urine of persons supposedly tuberculous are recorded by Brown (*Journ. Amer. Med. Assoc.*, 13th March 1915). In the first place, the smegma bacillus may readily be mistaken for the pathogenic organism, for no staining methods are absolutely certain in differentiation. About 65 per cent. of persons have the smegma bacillus on the outside of the penis, and about 46 per cent. have it inside the anterior urethra. This is found even when the smear is decolorised with 25 per cent. sulphuric acid, and in about one-fifth of the cases the bacilli still retain the stain after decolorisation with acid alcohol. There is, therefore, no absolutely reliable differentiation method obtainable by processes of staining. In the next place, the tubercle bacillus may pass through the kidney and be found in the urine, without setting up any lesion in the kidney, when there is some other affected organ from which a bacillæmia at times takes place; several cases of urine containing tubercle bacilli have been recorded in which no lesion of the kidney was found post-mortem. The writer collected 104 cases of pulmonary tuberculosis in which 10 per cent. excreted tubercle bacilli in the urine, while other workers have obtained a much higher percentage. However, when the presence of tubercle bacilli in the urine, proved by animal inoculation or by the microscopic finding of "showers" of these bacilli from time to time, is accompanied by diurnal irritability, slight albuminuria, slight pyuria, lumbar pain with or without hæmaturia or nodular enlargements in the epididymis or prostate, he considers that a diagnosis of renal tuberculosis may be made, and this will probably be confirmed on cystoscopic examination by an expert.

ANTI-TYPHOID INOCULATION.

There is much interest in this at the present time in view of the large scale upon which preventive inoculation has been carried out among the British troops. According to official statistics (*Pamphlet*, Gen. No. 2462), the figures obtained in the 24 "Test Units" were 56 cases with 5 deaths from enteric fever among 10,378 inoculated men, as compared with 272 cases and 46 deaths among 8936 non-inoculated men. Recent figures of the present war are even more favourable in showing the benefit gained by inoculation: thus there were 359 cases of typhoid among the uninoculated with 48 deaths, but only 111 cases among the fully inoculated (within two years) with one death only. Recent figures from the Italian Army, dealing with the

Tripoli campaign, are also available (*Presse Médicale*, 7th January 1915). The practice was to give three doses either of the vaccine of Vincent or of that of Kolle-Pfeiffer. The former of these is a mixed vaccine, prepared from various typhoid and paratyphoid strains of organism. The non-vaccinated had a morbidity of 35.3 per 1000 (very much the same as the British "Test Unit" figure), with a mortality of 7.1 per 1000. On the other hand, out of 3496 soldiers who had received Vincent's vaccine 29 per 1000 took the disease without a death in Cyrenaica, while in Tripolitana there were no deaths at all among the inoculated cases.

An interesting study of the Widal test, as concerned with the incidence of enteric fever following upon immunisation, was published by Trowbridge, Finkle and Barnard (*Journ. of Amer. Med. Assoc.*, 27th February 1915). Following upon several cases of typhoid in a school and colony in the spring of 1914, a search was made for the presence of "carriers." The Widal test was performed on 1601 inmates, of whom 28 gave a positive reaction, and of these 8 were found on closer examination to be carriers of the bacillus. Following on this, 1520 patients were inoculated in the usual manner with antityphoid vaccine, and another Widal reaction was performed on 1390 of these. It was found that among these recently inoculated cases the reaction was distinctly positive in 477 cases, negative in 648 cases, and atypical in 265. Three months later an epidemic broke out again, which was traced to the milk supply, and in all 57 cases were diagnosed as clinical typhoid. Of these 44 had been inoculated within three months; 11 had never been inoculated. The proportion of cases occurring among inoculated and non-inoculated respectively was much the same as that brought out by the British Army figures, viz. that about one-half as many cases occurred in the protected as in the unprotected, while the mortality among the protected was less than one-half that among the non-protected. As the milk supply in this case was the cause of the epidemic, it is obvious that inoculated and non-inoculated alike shared the risk, and that the varying incidence cannot be explained as due to greater caution on the part of the inoculated. An interesting point brought out is that the Widal reaction is a very uncertain guide as to the presence of immunity, for of those who developed typhoid fever in this epidemic 14.3 per cent. had given positive Widal after inoculation, 21.3 per cent. had given atypical reactions, while in only 64.3 per cent. had the result been negative. It also appears that the use of the typhoid prophylactic does not prevent the development of paratyphoid infection at a subsequent period.

In consequence of the admittedly great value of typhoid vaccines as a prophylactic, Krumbhaar and Richardson have investigated in the Pennsylvania Hospital (*Amer. Journ. Med. Sci.*, March 1915) their action as a means of treatment. Altogether they treated 93 cases of enteric

fever by typhoid vaccines, and collected the results of other workers besides themselves in 1806 cases. Of these 1806 cases 99 died, and there were 88 relapses. Although they do not speak enthusiastically of this mode of treatment, they consider that it has a logical theoretical basis, and that practical proof of its value is afforded by the rise in agglutinin curves after such vaccination. They consider that the best results are obtained if the injections are begun early in the disease, especially before the tenth day. As regards dosage, administrators differ; but these writers consider that the best initial dose for the average adult is 500,000,000 bacilli, with two or more larger doses given usually at three-day intervals.

ARTIFICIAL PNEUMOTHORAX.

This method of treatment in pulmonary tuberculosis continues to receive trial. Mace (*Journ. Amer. Med. Assoc.*, 13th March 1915) records his results in 34 cases treated by this means. He considers that the most favourable cases for lung compression are those in which cavity formation has not occurred, but which, under usual modes of treatment, are progressing towards softening. In some cases, however, with large cavities, much relief of distressing symptoms may be obtained by compressing the more advanced lung. He also considers that this is the most rapid and effective method of treating large pleural effusions after removal of the fluid, and that hæmorrhage is usually promptly and permanently relieved by this means. Woodcock and Clark gave the results of a wider experience of over 2000 cases (*Brit. Med. Journ.*, 1914, vol. ii. p. 1016). Their site for puncture is somewhat different from the usual one, being at the junction of the mid-axillary line, with a line running straight out from the nipple. The gas should not be forced in under a greater pressure than that of 3 inches of water. In severe cases the danger is considerable, because the portion of lung available for breathing may be much reduced. In cases of severe hæmoptysis artificial pneumothorax may be the means of saving the patient's life.

J. D. C.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

ON INJURIES OF NERVES BY FIREARMS.

AMONG the many surgical questions which the war has forced on the attention of surgeons not the least important is that of injuries to nerves. Already many cases have come under the notice of those attached to military hospitals, and as time goes on the number of cases will greatly increase. Several valuable papers on the subject

have already appeared in the French medical press, and it is evident that there are various points on which the accepted views, based on experience of such lesions met with in civil practice, will require to be revised. Claude, Vigouroux, and Dumas (*La Presse médicale*, 4th March 1915) record tentatively their experiences based on a study of 400 cases of lesions of the nervous system treated in the region of the VIIIth Army. In 100 of these cases surgical intervention has been considered necessary for lesions of peripheral nerves, and it is to this series that the authors direct special attention, particularly in regard to three points—(1) In what cases is surgical intervention indicated? (2) When should it be undertaken? and (3) At what level should the operation be carried out?

The authors point out that the changes in nerves as a result of injuries by shells, shrapnel bullets, and rifle bullets give rise to complex clinical syndromes often very different from those met with in neurological practice in time of peace. In contrast with a simple division of a single nerve trunk without infective complications, the lesions sustained in warfare usually implicate several nerves and their branches, and give rise to motor and sensory symptoms in different nerve territories. Further, the interference with function, which results from ankylosis of joints, contracted and painful cicatrices, or contracture of tendons, may simulate a paralysis, more or less complete, of certain nerves, and so add to the difficulties in diagnosing the nature and extent of an associated nerve lesion. Another difficulty is introduced by the emotional state of many of the subjects of such injuries produced under the conditions of modern warfare. Psychical paralysis may exist alone or may complicate organic paralysis. Lastly, it is necessary to bear in mind the possibility of premeditated simulation.

The writers lay great stress on the importance of a complete neurological examination by an expert before any surgical intervention is undertaken.

Among the indications for operation they first mention pain. When a neuralgia persists and is exacerbated by slight effort or gentle pressure, and when it resists ordinary medical treatment for some weeks, operation becomes necessary. It is almost certain that the nerve is involved in cicatricial tissue, and that its compression will go on increasing. Such pain causes the patient to assume vicious attitudes, and contractures and ankylosis add greatly to the difficulties. The most frequent indication is persistent paralysis, which shows no tendency to improve, and which is accompanied by disturbances of sensation and trophic changes which are also progressive.

Operation is indicated also in all cases in which it is possible to feel the nerve below the wound enlarged and nodular, and when pressure on the nerve is painful.

The authors have, as a rule, refused to operate on patients who are not suffering and when there is a tendency to improvement in the motor functions, particularly if the electrical reactions of the muscles are favourable.

It is not so easy to decide the time at which operative interference should be made. When the clinical facts, together with the electrical reactions, demonstrate clearly that a nerve has been divided, it should be operated upon at once. Unfortunately, however, the complications associated with a suppurating wound, with fractures, etc., interfere with thorough and satisfactory examination in the early days after the injury, and so prevent operation being done immediately. Approximately, the authors fix the best period for operation at about six weeks or two months after the wound has been sustained.

As regards the level at which the operation is to be performed, this is decided by a careful study of the clinical features and electrical reactions in each case. It is almost always a little below the line of trajectory of the projectile that the maximum lesion is to be found.

Pathological Anatomy.—In cases of this class it is necessary to distinguish successively (1) the lesions of nerves; (2) the lesions of surrounding tissues; and (3) the way in which these react on one another. The *lesions of nerves* are divided into (*a*) complete sections; (*b*) incomplete sections; and (*c*) indurations without section. The classical *complete section* of a nerve trunk, in which the segments are separated by 5 to 12 cm., and the upper end terminates in an ovoid neuroma while the fibres of the lower end are scattered among the surrounding tissues, is comparatively rare, only 22 per cent. of the authors' cases being of this nature. They have met with it only in the sciatic nerve and in the nerves of the arm, particularly the radial (musculo-spiral). In this class are also included nerve injuries complicating extensive infected wounds by shells, in which the nerve is shattered and its fibres dispersed amongst the surrounding cicatricial tissue. It sometimes happens that some of the fibres retain their power of conductivity, and there is a persistence of some degree of sensibility.

Incomplete sections are due to lateral or central wounds of the nerve. They are followed by the development in the substance of the nerve of a densely hard nodule of cicatricial tissue, the volume of which is always greater than that of the nerve tissue lost. In certain cases this fibrous nodule forms adhesions with surrounding tissues and complicates matters. Central wounds or perforations of the nerve are very rare (8 per cent.), and are produced by a bullet or by a fragment of bone. Lateral wounds, on the contrary, are common (over 50 per cent.). The fibrous nodule is more evident on one side of the nerve, and on the other side the healthy nerve fibres can be

recognised. Above the lesion the nerve trunk is normal in appearance, of a violet colour, while below it is appreciably thickened, whitish-yellow or ecchymotic, and indurated. Great care is necessary in removing the nodule not to leave any fibrous tissue behind, and, on the other hand, not to destroy the remaining healthy nerve fibres.

Another lesion met with is *induration of the nerves without section*. This is of the nature of interstitial neuritis. The nerve is of normal size, but is dull grey in colour, lustreless, abnormally vascular or studded over with petechiae, and firm to the touch.

The lesions of surrounding parts vary with the missile—fragment of shell, shrapnel bullet, or rifle bullet—and with the degree of infection, but, as a rule, there is a considerable quantity of cicatricial tissue.

The connection of the nerve with the surrounding cicatrix also varies. Sometimes there is merely a zone of sclerosis around the trunk, compressing it; sometimes there is an annular band constricting the nerve.

When the nerve is wounded the cicatricial nodule forms adhesions with the surrounding tissues of varying extent.

The authors recognise that sufficient time has not yet elapsed to admit of definite statements with regard to the ultimate results of operative interference in such cases, but the statistics they put forward justify the claim that with careful selection of cases, and with due conservatism, the liberation of the damaged nerve and its mobilisation in healthy tissue is a sound surgical procedure.

TREATMENT OF FRACTURES IN THE REGION OF THE ELBOW.

In a recent paper Neuhof and Wolf (*Surg. Gynec. and Obstet.*, March 1915) record the final results obtained at the Mount Sinai Hospital Dispensary in 100 cases of fracture in the region of the elbow joint. These include supracondylar, external condylar (capitellum and epicondyle), internal condylar (trochlea and epitrochlea), upper end of radius, and upper end of ulna. Ninety-one of the patients were children, and nine adults. The method of treatment adopted consisted in reducing the fracture (under anaesthesia if necessary), fixing the elbow in the position of "hyperflexion," by which is meant "the most acute flexion in which the elbow can be fixed without obliterating the radial pulse," and employing early passive movement and massage. The result was "perfect" in 53 per cent. of the cases; the remaining 47 per cent. presented results more or less imperfect. Any case in which there was not full and normal range of motion was considered imperfect, although in many of the imperfect group the joint was in every way useful.

The authors found that the prospect of a perfect result was most hopeful when the fractures were immobilised for the briefest period

possible, and when massage and passive movement were instituted thereafter. When mobilisation and massage were commenced in the first week after injury the results were perfect in 27 out of 29 cases, and the longer mobilisation was delayed the less satisfactory were the results. The sooner mobilisation and massage were commenced the shorter was the period of treatment necessary. Six of the cases were operated upon to secure apposition of the fragments, and in none of these was a perfect result obtained.

The authors explain at length the rationale of the hyperflexed position, abolition of the leverage of the forearm on the fragments, the splinting action of the triceps muscle, maintenance of the carrying angle, and of the power of flexion. The forearm should be in the position of supination, with the thumb pointing directly outwards, and the position is secured by a form of figure-of-eight bandage.

Mobilisation and massage are commenced about the fourth or fifth day after the injury, and practised daily, the patient being encouraged to move the joint voluntarily as soon as he is able to do so. The elbow is fixed in hyperflexion after each treatment. The duration of treatment varies widely in different cases.

These results interest us, as they confirm what has for many years been the routine practice in the Edinburgh School.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

G. H. MELVILLE DUNLOP, M.D., AND A. DINGWALL
FORDYCE, M.D.

VULVO-VAGINITIS IN LITTLE GIRLS.

COMBY (*Arch. de Méd. des Enf.*, March 1914) discusses this condition, basing his remarks on a study of 152 cases. He regards this affection as an exceedingly common one, especially amongst the poor, where overcrowding and the lack of resources imposes a community in the use of beds and of toilet articles. In Comby's experience vulvo-vaginitis was very uncommon during infancy, only one case having occurred under a year in his whole series. In the second year it becomes more frequent—when the little girls commence to share a bed with their mother or older sisters. Eighty-four, or more than half the cases, occurred between the second, third, and tenth year. In the great majority of cases the disease is contagious, and owes its origin to infection from a leucorrhœa in the mother which is purely accidental. Very rarely, indeed, is it of venereal origin, or the result of a criminal attempt. Many women who suffer from a leucorrhœal discharge, and who are incapable of transmitting gonorrhœa to their husbands, nevertheless infect their children by sleeping with them or

by sharing the same toilet articles. Transmission from one child to another takes place very readily either directly or indirectly. Acute contagious vulvo-vaginitis must be distinguished from aphthous and impetiginous vulvitis, from anæmic leucorrhœa, and from traumatic or irritative vulvitis caused by onanism or worms. These latter are all mild, non-specific, and easily cured conditions, while gonococcal vaginitis must be regarded as a most persistent malady, which is not infrequently attended with serious results. When the vulva only is affected the process may be quickly cured, but when the vagina is invaded the prognosis is more serious, and a cure much more difficult to effect. The complications which most commonly occur are cystitis, urethritis, arthritis, purulent conjunctivitis, proctitis, and peritonitis. Comby regards the peritonitis which occurs consecutive to vulvo-vaginitis as by no means a very grave condition, and he records eight cases, all of which recovered without any resort being had to operative measures. Other observers have not had such favourable results, and numerous fatal cases are recorded both with and without operative interference. Many authorities consider that this malady is frequently the cause of malformations of the uterus, of dysmenorrhœa, or even of sterility, and that some cases of suppurative salpingitis of uncertain origin in virgins may be due to a latent gonococcal infection dating from childhood.

Relapses are very common without any fresh exposure to infection. These relapses show the necessity of continuing treatment long after all suppuration has ceased, and even after negative bacteriological examinations have been established.

The duration of vulvo-vaginitis is very indefinite. In 26 cases that were carefully supervised and treated the malady lasted 20 months, and Epstein reports cases lasting several years, which facts show how very virulent and persistent is the infection. The treatment of the condition has hitherto proved far from satisfactory, and most writers on the subject take a very pessimistic view regarding the measures which have been employed in attacking the disease. Recently the employment of vaccine treatment has encouraged the hope that by this measure a means has been discovered of combating this very persistent malady. Comby has treated ten little girls suffering from vulvo-vaginitis with anti-gonococcus vaccine, and is much gratified with the rapid cessation of the vaginal discharge under this treatment. The injections were made into the muscles of the thighs every 3rd or 4th day. After the second, third, or fourth injections a cure was established in all the cases, and in one case of gonococcal ophthalmia a similar satisfactory result was obtained. Local measures should always accompany the vaccine treatment in the shape of frequent irrigation of the vagina by boracic solution, followed by the application of argyrol or some other silver salt, 1 in 1000.

Prophylaxis consists in preventing contact between children and women suffering from a vaginal discharge, and isolating those who are infected by forbidding the common use of bed, bath, and toilet articles.

The following are the chief points emphasised in the paper:—

1. The predominance of the gonococcus as an etiological factor in the production of these vaginal discharges, and the necessity of making periodic bacteriological examinations.
2. The long duration of the malady and the frequency of latent periods of apparent cure during its course.
3. The gravity of the complications that are apt to occur.
4. The inefficiency of the treatment formerly employed.
5. The encouraging results of vaccine treatment.
6. The great importance of prophylaxis both in the home and in hospital.

GONOCOCCUS SEPTICEMIA FOLLOWING SCARLET FEVER.

Nicoll reports three cases of this condition (*Arch. Pediat.*, November 1914) accompanied with arthritis, not on account of its rarity, but as demonstrating the necessity for routine blood-cultures in cases of so-called scarlatinal arthritis, the occurrence of which is a fairly common complication in hospital practice, although its frequency varies in different epidemics. The causative factor of this arthritis, notwithstanding the numerous theories in regard to it, remains as little known as that of scarlatinal nephritis, although the occurrence of both during the convalescent stage of the primary disease would suggest a common origin. Blood-cultures taken from cases of scarlatinal arthritis of the ordinary type are usually negative, nor do the course of the temperature and general symptoms of most of the cases suggest the presence of general sepsis. In the tendency towards chronicity, the production of more or less thickening and limitation of function in the involved joints, the disease resembles more closely gonococcus arthritis than ordinary acute articular rheumatism, and, furthermore, differs from the latter in that it frequently occurs in children under five years of age, while, on the other hand, the liability to endocardial involvement seems to be equally pronounced in both.

How many cases of scarlatinal rheumatism, occurring especially in hospital practice, are really due to gonococcus infection it is not possible to say, but there can be no doubt that a number of such cases escape recognition through neglect to take blood-cultures. The presence of an eruption in the 3 cases reported—not usually seen in cases of scarlatinal arthritis—suggesting the presence of a blood infection, was responsible for the taking of blood-cultures, and thus led to a correct diagnosis. The prognosis of gonococcus infection of the blood in children, while grave, would seem to be less so than in adults,

and the liability to destructive heart lesions less pronounced. The value of gonococcus vaccines in the more or less chronic complications of gonorrhœa would lead one to expect benefit to follow their use in cases of arthritis.

DIABETES IN EARLY INFANCY.

Knox, writing on this subject (*Johns Hopkins Hosp. Bull.*, xxiv. 274), states that the condition appears to be one of the rarest affections of early childhood, as out of 6496 cases of diabetes which occurred in England and Wales in ten years, there were but 8 under 1 year. After giving an account of a case in a healthy breast-fed infant, aged 9 months, which terminated fatally in eleven days, the author analyses in detail 16 reported cases under a year, the records of which he had collected.

The disease, though still very unusual in infancy, seems to be becoming more frequent. In more than 40 years—1852 to 1896—only seven cases were reported, while during the last fifteen years 9 cases occurring in babies had been described. The same disproportion as to the occurrence of the disease between the sexes seems to prevail as amongst adults, as in 14 cases in which the sex is reported 11 occurred in males and only 3 in females. In 3 cases the disease was detected within a few days after birth, and in the other 13 several months (5 or more) elapsed before the disease was recognised. In 3 instances there was a family history of diabetes, and in two others there was a tuberculous inheritance. In 6 of the cases the condition seems to have followed an injury to the central nervous system, either as the result of injury during delivery, or from a severe fall on the head at some subsequent period.

Four cases were associated either with increased cerebral pressure or deformity of the brain—hydrocephalus and encephalus.

In several instances diabetes followed the ingestion of unusually large quantities of sugar in previously healthy babies. The majority of the cases showed certain symptoms in common. At first restlessness was usually noticed; this was followed by increased thirst and hunger and the passage of unusually large amounts of urine; loss of weight was a prominent symptom wherever the descriptions were adequate. Multiple abscesses occurred in 2 cases, gangrene of the lungs in 1, and sore over the sacrum in another. At least 3 cases ended in coma, and acetone was noted in the breath or urine in 4 instances.

Thirteen cases died and 3 apparently recovered. The first two of those that recovered were definitely milder in type, and the last was probably helped by efficient and prompt therapy.

The duration is somewhat variable, depending largely upon the severity of the symptoms. The majority of the cases terminated in

3 weeks, one of them in a few days. One case lived for two years and others for several months.

The urinary findings are naturally somewhat incomplete. The average specific gravity varied from 1010 to 1036, which is high for infants. The amount of urine passed was in every case large, but only in one case could the measurement be relied on as accurate, and in this infant 680 c.c. were passed in 24 hours. The sugar present varied from 1 to 10 per cent., and in nearly every instance the precipitate with Fehling's solution was abundant. Albumen was practically never present. In several instances attention was drawn to the condition by the stiffness of the napkins in drying. In an Indian case the collection of flies on the napkins first aroused suspicion. In an older child white sugar remaining on the floor where the child had voided urine drew attention to the malady.

The presence of glucose in the urine does not, of course, indicate diabetes, for it is quite common to meet with glycosuria both in cases of gastro-intestinal disease and in infantile eczema.

The prognosis, though very grave, is not absolutely hopeless, even in infancy.

Treatment should be begun early, and though more difficult to carry out, should follow the lines found most successful in adult diabetes, *i.e.* the patient's carbohydrate tolerance should be determined, and the sugar content of the milk diet correspondingly reduced, the calorific requirements being furnished by fats and proteids.

G. H. M. D.

MENTAL DISEASES.

UNDER THE CHARGE OF

JAMES MIDDLEMASS, M.D.

MOBILISATION AS A TRAUMATIC CAUSE IN PRODUCING DEMENTIA PRECOX.

AT the present time the influence of the war is being traced in many directions. In previous wars many papers and a few books have been written on the effect of military operations on soldiers and on the community generally. As was to be expected, the present war, which so greatly exceeds all previous ones in the numbers of those affected, both directly and indirectly, has already produced a number of papers bearing on its effect in relation to the occurrence of mental disease. One of these papers is by Dr. Jörger (*Corr.-Bl. f. Schweiz. Aerzte*, 12th December 1914). It is based on experience at the Zürich Asylum. As Switzerland is not at war, the effects of simple warlike preparations can be studied apart from those produced by war itself. In his paper he relates the particulars of 13 soldiers who were called

up on mobilisation, and who soon after developed insanity, of the dementia præcox type. In analysing these cases he finds they fall into three groups. In the first the symptoms of dementia præcox had been present in a mild form for some time previously. The stress of mobilisation merely added fuel to a fire already burning. In the second group there was a history of a previous attack which had been recovered from. In the third the patients had previously been perfectly well. This forms the largest of the groups. Some of these recovered quickly, especially those in which alcohol was a complicating factor, but others improved very slowly, and seemed likely to be incurable. In addition to these he relates the cases of four women who also became insane as a result of excitement produced by war. It is noteworthy that in all of them, as well as in some of the men, there was a great dread that they would be shot or experience a sudden and violent death. He does not state whether any other form of mental disease besides dementia præcox has been met with by him as a result of mobilisation. He likewise makes no suggestion as to why this form so frequently results from that cause, except in the first group mentioned above. It is probable that, like many others, he considers dementia præcox to include nearly all cases of insanity occurring between puberty and senility.

RECENT CHANGES IN LUNACY ADMINISTRATION IN THE UNITED STATES.

In the year 1911 the State of Massachusetts passed a law permitting the superintendent of any asylum for the insane to receive any person on the request of certain responsible individuals without any further legal process. This gave the superintendent the right to detain such a person for seven days for examination and observation. The only exception is in cases of delirium tremens and drunkenness. If deemed unsuitable for care, the superintendent may hand the patient over to the person who requested his admission. If deemed suitable, he may remain as a voluntary patient, or, if necessary, may be certified in the usual way. Another section of the same Act makes it possible for any person voluntarily to seek admission to any asylum, suitable arrangements being made for his maintenance there. These are very radical changes in the old law, and the results of their operation are worthy of close study. This has been done as far as concerns one asylum or State Hospital, as it is called—that of Boston. As was to be expected, in an enlightened city such as it professes to be the effects of the new law have been carefully watched, and various voluntary agencies have been set in operation to assist in carrying out its intentions, which have avowedly been the provision of early treatment of mental disease. Several papers have appeared giving the results, statistical and other, which have been observed by the staff

of the Psychopathic Department of the Boston State Hospital, to give its official title. These refer to the year ending 30th May 1911 (*Boston Med. and Surg. Journ.*, 3rd December 1911).

Dr. Southard, the Director of the Department (p. 847), deals with three aspects of his work. As regards what he calls the temporary care service of the Hospital, his opinion is that "it has been of untold benefit to hundreds upon hundreds of patients." The fears that the so-called liberty of the subject would be seriously interfered with have not in any sense been justified. The great and rapid increase in the number of such cases treated shows that it is being taken advantage of, and with good results. His experience regarding voluntary admissions is likewise wholly favourable. To be of real use he thinks the charge for such patients should be on public funds. As soon as this was done the admission of such cases, as was to be expected, rose very materially. The early treatment which can be obtained by this means has undoubtedly saved the patient more serious illness, which would probably have cost the community more than the maintenance during the voluntary stay. The third point discussed by Dr. Southard is the number of patients admitted to his department who were discharged as not insane. They formed about 23 per cent. of the whole. He thinks this shows that the services to be obtained there are being recognised as beneficial, not only for mental but for nervous disease also. There are many of his patients who suffer from psychoneurosis and border-land cases who do well under treatment similar to that required in fully developed psychoses, and it is convenient to have the two treated in one department.

His general conclusions are decidedly in favour of improving the facilities for the treatment of mental derangement under the conditions of general hospital and private practice, and that voluntary admissions to existing or future hospitals for the insane should be stimulated.

Dr. Stearns writes on a very important feature of the work of the department—the after-care of the patients (p. 850). This work has been of gradual evolution, and has grown up on no formulated plan, but solely as the result of experience. It has developed chiefly in connection with the out-patient department, which has grown rapidly, and now forms a very important feature in its operations. With it there is associated a considerable body of voluntary workers under the direction of paid officials. All patients leaving the Hospital pass through this department, and they are visited at their own homes if possible, or are advised to report themselves again at the Hospital. Alcoholics form a considerable proportion of the cases, and much can be done by home visitation to keep them on safe lines. A monthly meeting called the "Men's Club" is useful as a means of keeping in touch with them. Advice is given when illness again threatens, and

steps can be taken to ward it off before it becomes established. In this way also a "public health conscience" will gradually be developed, which will, no doubt, exercise a beneficial effect. The securing of employment is often difficult for recovered mental cases, and in many is essential if good health is to be maintained. The social service helps materially in this direction. Statistics are given of the numbers and forms of disease of the patients dealt with, but it is not necessary to particularise these.

Miss M. C. Jarrett reports on the economic side of the social service already referred to (p. 852). She estimates that this service requires for its efficient working a staff as large as that for in-patients. She refers to the valuable work of the service in securing histories of the cases, which will in time furnish valuable evidence in helping to solve some of the problems of heredity. Intimate co-operation is maintained with various other public and voluntary agencies, so that overlapping is avoided and mutual assistance given.

Dr. Haines reports on the mental defectives which had been under treatment in the Hospital (p. 854). Of these there are an astonishing number. The well-known Binet-Simon tests are used, and by these means, out of 329 patients under 25, about 46 per cent. were found to be defectives. Twenty per cent. were also delinquents. Instructive tables are given of the facts elicited by examination.

Drs. Yerkes and Bridges report on a system of investigating the mental capabilities of patients on much the same lines as the Binet-Simon method (p. 857). It is, in their opinion, an improvement on the latter. They designate it the point-scale. For details, reference must be made to the paper itself.

THE ROLE OF THE PSYCHIATRIC DISPENSARY.

Dr. Macfie Campbell gives a review (*Amer. Journ. of Insanity*, January 1915) of the first year's work of the Phipps Psychiatric Clinic at Baltimore. The work of the dispensary is mainly confined to out-patients, though most of the in-patients enter by its portals. Seven hundred and eight patients were dealt with, and they are classified roughly into various groups. Of the total 236, or one-third, were children under sixteen. Dr. Campbell looks upon this as the most important part of the work, especially from a social point of view. The conditions for which they were brought varied very widely. Some were brought for slight silly habits, others for grave nervous disease or moral defect. The grouping of the cases is shown on a chart. Twenty-five were found to be normal; the others were divided into two classes according as they did or did not show a definite defect of intelligence. This was ascertained by the Binet-Simon tests. Of the 211 examined 148 were found to have varying degrees of mental defect. The dis-

orders which were the cause of their being brought to the dispensary included some of psychosis and neurosis. The former was found to be developed at some very early ages, even at seven. Dr. Campbell emphasises the great value of the social service which is attached to the dispensary. Cases are visited at their homes, and in many instances the environment can be influenced for the patient's benefit. In not a few the diseased condition was found to be dependent more on the persons surrounding the patient at home, and instruction of these on the necessary lines was followed by the cure of the disease. This was specially the case where the fault was a bad habit or some slight moral defect. The social service seems to be a marked feature of American hospitals, and its value is apparently rated very high. We have nothing in this country exactly like it, though it is recognised that the After-Care Association does much very useful work on somewhat the same lines. In America, however, investigations of a more purely scientific character, especially in tracing the influence of heredity and environment, are included in social service work. Dr. Campbell is optimistic about the future of the dispensary, and hopes that the time may come "when it will be possible not merely to say what might be done for a patient, but to see that actual steps are taken which will give the patient the best chance of returning to an efficient level."

DERMATOLOGY

UNDER THE CHARGE OF

W. ALLAN JAMIESON, M.D., LL.D., AND R. CRANSTON LOW, M.D.

ITCHING IN URTICARIA.

COUGHLIN (quoted in *New York Med. Journ.*, 5th September 1914), writing in the *Interstate Med. Journ.*, September 1913, says that to relieve the itching in urticaria both lotions and powders may be used, either singly or together. The best lotion is either a solution of phenol in hot water, to which glycerine has been added—R Phenolis, grs. xxiii.; glycerini, ʒi.; aquæ ferventis, ʒiv.; miscet et fiat lotio—or one of hot water containing 33 per cent. of vinegar. These are to be mopped on, and while they are drying the surface is powdered either with fresh starch, bismuth subnitrate, or zinc oxide containing 2 per cent. of menthol or camphor. Internally valerian may be given. Bromides and chloral hydrate may make matters worse, their use often giving rise to urticaria. Digestive disturbances are frequently the cause of the condition. If this is the case in the patient under observation, a dose of castor oil, followed by a bland diet, will prove beneficial.

TREATMENT OF RINGWORM OF THE SCALP.

Bechet (*New York Med. Journ.*, 17th October 1914) cautions against the X-ray treatment of this complaint. In the hands of one experienced in the use of the rays it may be quite successful, but ought not to be undertaken by those not familiar with all the details of their employment. He has seen several cases of permanent alopecia follow exposure to X-rays in the treatment of tinea tonsurans. Sometimes the results, from a cosmetic point of view, are much worse than the original lesions. It must be borne in mind that the disease tends to disappear spontaneously at about fourteen years of age, and that the temporary inconvenience of a slower method—which is successful when persistently carried out—is preferable to the risks of permanent baldness and cicatricial formation, succeeding an X-ray dermatitis. The gradual disappearance of the ailment at about the time of puberty seems to him more than a coincidence, and he thinks it probable that some internal glandular secretion, which in some way influences the hair follicles of the scalp, develops at puberty and renders the soil unsuitable to the further life or growth of the fungus. This question of soil demands careful inquiry into the child's general condition, and tonics, both medicinal and hygienic, are indicated. In the local management of ringworm of the scalp the selection of which parasiticide one ought to employ is not as important as the thoroughness and persistence of its application. The mere smearing on of an ointment is futile. It must be rubbed in well by means of the ball of the thumb, or, better, with a brush with short bristles. The hair should be kept cut close; the time spent in the application of the remedy chosen at least ten minutes, and twice a day.

SPOROTRICHOSIS.

This complaint, first described by Schenk in 1898, is regarded as one of the rarer forms of cutaneous parasitic disease. The fungus, the sporotrichium Schenkii, is met with as a saprophyte in flies, caterpillars, and on some vegetables. In the large majority of cases infection occurred on the hand, and the injury which gave rise to the breach of surface, when this was noticed, by which the fungus gained entrance, was commonly a trifling one. A subepidermic swelling appears, which bursts, discharges a greyish-yellow pus, and forms an ulcer, often purplish in colour, and not as a rule painful. It refuses to heal under ordinary treatment, while fresh lesions manifest themselves in the course of the lymphatics higher up the arm. Sutton (*Journ. Amer. Med. Assoc.*, 3rd October 1914) observes that of fifty-eight cases in the United States during fifteen years, no fewer than fifty-four became infected while residing somewhere in the region comprising the Mississippi River basin. He records and illustrates five examples. The disease may be confused with tuberculosis and syphilis yet has

features distinct from both. It rapidly gets well when iodide of potassium is administered in fairly full doses. A bacteriological test should be made as early as possible, otherwise the employment of powerful antiseptics as iodine may render cultural examination negative, even though the fungus may be present. According to Malcolm Morris the best medium is Sabouraud's peptone glucose agar.

AVERAGE DURATION OF LIFE IN CHILDREN SHOWING POSITIVE SKIN TUBERCULIN REACTION.

Rogers (*Boston Med. and Surg. Journ.*, 4th February 1915) has made a study of children with positive skin tuberculin reactions, the number examined amounting to 69 in three years. He concludes that before the age of two years a positive skin reaction seems to be an indication that the child's life is likely to be a short one. The mortality among all children up to the age of 10 who react to the von Pirquet test is much higher than that of normal children. The series is, however, too small, and the time since the tests have been made too short, to permit any but the most general conclusions to be drawn.

PSORIASIS.

Schamberg, Ringer, Raiziss, and Kohner (*Journ. Amer. Med. Assoc.*, 29th August 1914) have conjointly made an inquiry into the cause and nature of psoriasis. Although it constitutes from 4 to 5 per cent. of all skin diseases, its origin is still an enigma. There are two prevailing views—(1) That it is due to a parasite. (2) That it results from disturbed metabolism. Though the investigations isolated twenty-two different microbes from psoriasis scales, no germ was found which could be regarded as bearing a causative relation to the disease. They inquired into the metabolism of about a dozen patients suffering from psoriasis. The protein metabolism first commanded attention. The patients were kept on diets containing definite quantities of nitrogen and caloric value. The total nitrogen intake was compared with the total nitrogen output, and balances established. They soon learned that these patients possessed the power of retaining rather large quantities of nitrogen on diets on which normal persons could just maintain equilibrium, while on a very low nitrogen diet the psoriatic has the capacity of so altering his protein metabolism as to maintain equilibrium with perfect ease. When the question of the cause of the nitrogen retention was entered into, the rapid proliferation of the epithelial scales was specially noted. The cells when cornified are thrown off as scales, which are composed almost entirely of pure protein. Thus the patient requires abundance of protein as building material. A high protein diet favours the spread of psoriatic lesions, while a low one has the reverse effect. No harm is caused by keeping the patient on a very low protein diet for a long time, provided the caloric supply is sufficient to maintain the body

weight. Specimen charts of those diets are furnished. The more severe and widespread the eruption, the more readily will it be influenced by appropriate diet. A process of epithelial cell starvation is evoked. The reactivity of the skin to external medicaments, such as chrysarobin, is also augmented by such a diet. To secure the best results the diet should not contain more than forty-five grains of nitrogen daily. It was decided to determine the germicidal power of chrysarobin, and this was found to be practically nil. Calomel, which is highly germicidal, has but feeble action on the patches of psoriasis. They are of opinion that the effect of chrysarobin on psoriasis is due—(1) to the firm union it forms with the protein of the epithelial cells, and (2) to the abstraction of oxygen. In the subsequent discussion it appeared that some had not been so successful in improving psoriasis by a low protein diet as the observers.

THE RELATION OF DIET TO CANCER.

Bulkley (*New York Med. Rec.*, 24th October 1914) observes that the marked increase, as shown by statistics, in deaths from cancer deserves inquiry, and in particular as to the influence which a certain element, largely affecting the health and well-being of the individual and the structure and growth of normal and abnormal tissues, namely, diet, bears to this increase. It has been demonstrated that cancer is a disease of civilisation, increasing among those peoples who had previously been free from it, in proportion as they have adopted the customs, manner of life, and diet of those more highly civilised. With advancing civilisation diet has become more and more complicated, luxury and over-eating have grown, and this is specially true of meat-eating and of alcohol, coffee, and tea drinking. Among the well-to-do the consumption of meat is double that of fifty years ago, while deaths from cancer have increased fourfold. Cancer, again, is rare among those whose dietary is largely confined to the products of the ground. While those are conditions of the system which favour a diseased action of aberrant cells, so there are conditions which are antagonistic to the abnormal proliferation of cell tissue. Ehrlich has shown that mice living on a rice diet cannot be inoculated with cancer, while mice living on a meat one can readily be inoculated. The analogy of psoriasis is not without interest, as the researches noted in another excerpt show that a rigid vegetarian diet tends to restrain the profuse and disordered epithelial growth in psoriasis, while a high protein aliment encourages this. Bulkley has long held the view that meat-eating is productive of cancer, and has treated many cases on an absolutely vegetarian diet with remarkable and gratifying results. Ross holds that there is a failure of the potash element in those subject to cancer, and has given the salts of this mineral in large amount to those threatened with cancer, and even in advanced cases, with satisfactory effect. The waste of these

salts in process of cooking vegetables is highly significant. Why in some persons a disturbed nitrogenous equilibrium resulting in cancer occurs, while so many escape, remains as yet an unanswered question.

NORMAL SERUM IN PRURITIC CUTANEOUS DISORDERS.

Fouquet (*Journ. de Méd. Intern.*, No. 16, 1914) has tried serum obtained aseptically from a vein with good results. The coagulum having been allowed to form, the serum was drawn into a sterilised syringe and injected subcutaneously into the gluteal region. Five c.c. employed every other day gave the best results in adults. The only untoward effect was a slight urticaria in two out of sixty cases. In eczema the pruritus disappeared, but the eruption was uninfluenced. In urticaria it was remarkably efficient when associated with appropriate dietetic management. In vulvar pruritus it proved most valuable.

SULPHUROUS ACID IN THE TREATMENT OF FURUNCLES.

Skillern (*New York Med. Journ.*, 19th December 1914) recommends sulphurous acid in the treatment of boils. He gives one teaspoonful in a large glass of water three times a day after meals. The mouth must be well rinsed after each dose, and it is advisable to neutralise the remains of the acid in the oral cavity with milk of magnesia. Many cases have been recently treated in this way: the course of existing boils has been greatly abbreviated, and in no case has recurrence been met with. Hygienic directions ought likewise to be observed. Thus excessive indulgence in sugar should be avoided. Abstention from eggs is advocated. The area round the boil should be shaved, cleansed with benzine, and sterilised with tincture of iodine. Locally, evacuation of the core is desirable. The skin over and round the boil is well frozen and the part incised with a cataract knife, a small wedge being cut out. The pain is trifling, the soreness ceases, while the scar left is minute. If fluctuating, of course incision with evacuation is demanded. A boil should never be squeezed. It should not be palpated nor even touched.

PELLAGRA.

Page (*New York Med. Rec.*, 2nd January 1915) has been interested in the study of intestinal bacteria as a possible cause of pellagra. In addition to the colon group of bacteria which are found in the faeces of pellagrins, he has noticed a bacillus which may be the cause. This is longer and more sharpened at the ends than those of the colon group. It is motile, aerobic, sporogenous, stains readily, and grows on culture media. Of fifty-three cases of pellagra examined, the bacilli were seen in great numbers. Animal inoculation experiments have not been very successful. In a man pellagra has been induced by transference of cultures of the bacilli. Pharyngitis and bronchitis developed within three days, which were soon followed by definite intestinal and nervous

symptoms of pellagra. The microscope revealed the organism in its many forms. He has found ichtyol valuable in treatment. One to two five-grain pills, taken three times a day for eight to ten days, apparently cure the average case. In two instances eighty grains of the drug relieved all digestive and nervous symptoms, and with these the bacilli disappeared. He thinks the deleterious effects of the bacillus on the body are due to the production of toxic substances.

W. A. J.

NEW BOOKS.

Anoci-Association. By GEORGE W. CRILE and WILLIAM E. LOWER. Pp. xvi. + 259. With 60 Illustrations. London and Philadelphia: W. B. Saunders Co. 1914. Price 13s. net.

IN Part I. of this volume the authors present in consecutive form a statement of the kinetic theory of shock as it has been gradually evolved and elaborated in the various papers published by Dr. Crile within recent years. These views are already familiar to our readers, and have done much to mould our practice regarding the prevention and treatment of surgical shock.

The second part of the volume is devoted to an exposition of the application of the kinetic theory of shock to the technique of surgical operations. Under the term anoci-association Dr. Crile describes a somewhat elaborate method of employing local anesthesia with the combined object of preventing pain and of blocking the afferent channels by which noxious nerve impulses may reach the central nervous system and give rise to the phenomena of shock. Full directions are given with regard to the technique as applied to the more important operations, and this part of the work should be carefully studied by anyone who proposes to follow Dr. Crile's plan. "If performed perfunctorily, as a dull ritual, the technique of anoci-association will fail; it can accomplish its purpose only when each detail, however minute, is considered from the view-point of the individual patient."

BOOKS RECEIVED.

CRAIG, W. Posological Tables. Fourth Edition.	(E. & S. Livingston)	1s.
ENCYCLOPEDIA MEDICA. Edited by J. W. Ballantyne. Second Edition. Vol. I. Ab-As.	(W. Green & Son, Ltd.)	20s.
GEMLETTE, J. D. Malign Poisons and Chaffin Cures	(J. & A. Churchill)	3s. 6d.
GLAISTER, J. A Text-Book of Medical Jurisprudence and Toxicology. Third Edition.	(E. & S. Livingston)	15s.
JONES, L., and W. H. WOODCOM. The Commoner Diseases	(J. B. Lippincott Co.)	16s.
KELYNACK, T. N. Defective Children	(Dale, Sons & Daniellson, Ltd.)	7s. 6d.
KING, D. BARTY. Scheme for Dealing with Tuberculous Persons in the County of London	(Dale, Sons & Daniellson, Ltd.)	5s.
RANSOME, A. A Campaign against Consumption	(Cambridge University Press)	10s. 6d.
SHIPLEY, A. E. The Minor Horrors of War	(Smith, Elder & Co.)	1s. 6d.
SIMPSON, REV. A. B. The Gospel of Healing. New Edition	(Mareyton & Scott, Ltd.)	2s.
VIVIAN, E. C., and J. E. HODDER WILLIAMS. The Way of the Red Cross	(Hodder & Stoughton)	2s. 6d.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES.

CASUALTIES.

KILLED in the bombardment of the Dardanelles on 25th April, Fleet-Surgeon ADRIEN ANDREW FORRESTER, R.N., of H.M.S. *Implacable*.

Fleet-Surgeon Forrester graduated M.B., Ch.B. in the University of Glasgow in 1897, and entered the Navy as Surgeon in 1898. He became Staff-Surgeon in 1906, and Fleet-Surgeon in November 1914.

KILLED near Ypres on 13th May, Lieutenant GEORGE HAROLD LUNAN, R.A.M.C., aged 23.

Lieutenant Lunan graduated M.B., Ch.B. in the University of Edinburgh in 1913. He was attached to the 9th Lancers since the middle of October. He was slightly wounded on May 10th, but continued on duty till he was killed three days later.

KILLED in action in the Dardanelles on 5th May, Lieutenant JAMES MONTAGUE SMITH, 5th Royal Scots.

Lieutenant Smith was a senior student of medicine in the University of Edinburgh, and took a prominent part in all departments of University life. He was the eldest son of the late Dr. James Smith of Brunton Place, Edinburgh.

WOUNDED.

The following Medical Officers are amongst those recently reported as wounded:—

Major J. S. Y. Rogers, M.B. (Edin.), R.A.M.C. (T.F.).

Major J. F. Proudfoot, M.D. (Edin.), R.A.M.C. (T.F.), Oxford Yeomanry.

Major W. M. Mackay, M.B., Ch.B. (Edin.), R.A.M.C. (T.F.), 6th Durham Light Infantry.

Captain D. C. M. Church, M.B. (Edin.), I.M.S. (Turkish Arabia).

Captain J. M. Bowie, M.D., F.R.C.S. (Edin.), M.R.C.P. (Edin.), R.A.M.C. (T.F.), 9th Royal Scots.

Lieutenant G. L. K. Findlay, R.A.M.C.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—The following gentlemen, having passed the requisite examinations, have been admitted Fellows:—John Coffey, Dublin; Norman Grenville Walshe Davidson, Wolverhampton; Andrew Graham, China; Garnet Reginald Halloran, London; George Laurence, Chippenham; Joseph Currie Lorraine, Burma; Vernon Laurie Miller, Canada.

At the meeting of the Royal College of Surgeons of Edinburgh held recently the Bronze Medal and Microscope presented to the College by Colonel William Lorimer Bathgate, in memory of his late father, William M'Phine Bathgate, F.R.C.S.E., Lecturer on Materia Medica in the Extra-Academical School, was awarded, after the usual competitive written examination in Materia Medica, etc., held for session 1914-1915, to Mr. James Hood Neill, 33 Thirlestane Road, Edinburgh.

ON INVERSION OF THE *SEX-ENSEMBLE*.

By D. BERRY HART, M.D., F.R.C.P.E.,
Lecturer on Midwifery and Diseases of Women, School of the Royal
Colleges, Edinburgh.

PRELIMINARY.

THE question of sexual inversion is usually considered from the purely sexual standpoint. Normal men and women are heterosexual, each being attracted sexually by the opposite sex. A homosexual is attracted sexually by those of the same sex as himself or herself, and this abnormal condition has been present in all ages, and is in modern times a still existing and menacing problem. The subject of "homosexuality" is neither an attractive nor a usual one for investigation in Anglo-Saxon countries, but has been much discussed and written on in Germany, France, and Italy, where a large literature has grown up. The most prominent English writer is Havelock Ellis.²

I purpose, however, not merely considering the question of sexual inversion in its strict and scientific sense, but of taking up the broader aspect of "Inversion of the *Sex-ensemble*"—the "altogether" of the psychosexual function and anatomical structure making it up. The study of the anatomical conditions or Mendelian segments and secondary sexual characters in the atypical *sex-ensemble* (pseudo-hermaphroditism) has shown me that there is a disturbed probability distribution of male and female characteristics and organs in such, and not a mal-allotment of one characteristic—the psychosexual; and therefore, as already said, the question to be considered is not merely that of *sexual* inversion but of *sex-ensemble* inversion.

THE TYPICAL MALE AND FEMALE *SEX-ENSEMBLE*.

The typical *sex-ensemble* is either male or female, and is in general terms made up as follows:—In each there is a sex gland, ovary, or testis; a potent duct system, either Müllerian or Wolffian (vas deferens); these, with the phallic organs, comprise the *potent system*; an *opposite sex-duct element*—epoöphoron—the equivalent of the male epididymis; hydatid testis and prostatic utricle in the male, the degenerated equivalents of the Müllerian structures fully developed in the typical female; with a *secondary sexual system* congruent with the sex. In detail we have in the *typical male sex-ensemble*, descended and functional testes, normal prostate and Cowper's glands; a duct system in the form of the

vasa deferentia and vesiculae seminales; the opposite sex-duct elements, hydatid testis and prostatic utricle, and the congruent secondary sexual characters comprising type of pelvis, special hair distribution on anterior abdominal wall, heterosexuality with male mentality and vigour, defective mammae.

The *typical female sex-ensemble* has ovaries in the upper part of the true pelvis; uterus, tubes, vagina, external genitals, and mammae—the *potent portion*; the *opposite sex-duct elements*—epoöphoron, paroöphoron, and Skene's ducts—the *non-potent portion*. The *secondary sexual characters* comprise the hair distribution on the anterior abdominal wall, the pelvis, general body contour, heterosexuality, and female mentality, with in some cases an enlargement and prominence of the two upper central incisors.

It is to be specially noted that in the *sex-ensemble* it is the sex gland alone that determines the sex. The *sex-ensemble*, sex glands excluded, is made up of unit characters in a Mendelian sense—*i.e.* autonomous but united; and there are 38 potent to 4 non-potent, or 36 to 4 if we exclude the sex glands. The sex glands are excluded if we consider the probability results, as they do not enter into it. In the male *sex-ensemble* the ratio is 25 to 6 for the same reasons as above given.¹⁰

Can we allot molecules or molecular groups of Weismann's determinants in the germ-plasma, causal to the Mendelian unit-characters making up the adult sex-ensemble?

Weismann and the Germ-Plasma.—Weismann's generalisation of the continuity of the germ-plasma and its causality to adult structures gave one of the first serious checks to the Darwinian mechanism of evolution, at once raising the question of the causation and transmission of variations, supposed by Darwinians to be due to natural selection—*i.e.* to environment in its many forms. Darwin's great factors in his mechanism of the origin of species were (1) variation; (2) its transmission to progeny, accepted as a result from the mere somatic expression of variation; (3) natural selection, accepted as causal to somatic variations.

Darwin undoubtedly made a tremendous advance in evolution by proving the constant occurrence of variation in plants and animals; and this alone, apart from his other great work, places him at the head of the leaders of evolution in its more modern aspects. He supposed that minute variations due to natural selection accumulated until a condition of striking and advantageous variation obtained, and it was believed that naturally this

would be handed on to progeny. Darwin did not make clear to his own satisfaction how a somatic variation could be made causal in the germ-plasma; but at any rate he recognised the necessity of it, and thus tacitly admitted Weismann's generalisation.¹⁴ There was another flaw in the argument, as it seems to me highly probable that minute variations do not accumulate but are the expression of an intrinsic variation in the germ-plasma—that is, they are summed up in some form of frequency polygon. Thus in the question of height of individuals, a tall man or woman in a family is not a result of the accumulation of the transmission of minute increases of height in the past generations, but an expression of a probability extra distribution of the factors causal to height, and is associated in the same family with the existence of short or medium stature, and thus the results of the grouping of a sufficient number of heights—say 500 to 1000—are expressed in a homogeneous population by a symmetrical frequency polygon.

The pioneer critics of Darwinism were Fleeming Jenkin and St. George Mivart. The former urged that minute variations would be swamped—that is, would not appear afterwards in sufficient numbers—and this is what one would expect where minute variations give a frequency polygon. Such a polygon is the expression of the intrinsic variations of the determinants in the p. g. c. and p. s. c. masses at the time of their formation. The mechanism of Darwin has thus failed, inasmuch as variations are not due to natural selection acting on the plant or animal soma—the extrinsic theory—and the placing of such supposed variation causally in the germ-plasma is impossible, despite the efforts of Darwin and Semon and of those who call hormones to their aid. We must therefore consider what may be termed an intrinsic theory of variation, and explain how such variations are transmitted. At present the relation of such a theory is considered only so far as it applies to the *sex-ensemble*—ducts and secondary characters—in mammalia. In marsupials we have a female *sex-ensemble* where the Wolffian ducts are markedly represented in the lateral vaginal canals, while the uterus is bicornuous, and the Müllerian vagina is represented in the central canal. In the human female the Wolffian system is scantily represented by the epöphoron, while the Müllerian tract is fully present as tubes, uterus, and vagina, with the addition of the urinogenital sinus. The difference between these two is brought about by the polar losses of *sex-ensemble* determinants,¹⁰ and thus the complex marsupial *sex-ensemble* ends in the much more

simple one of the human female. If we take in the latter the relation between the *sex-ensemble* determinants of the germ-plasma and the *sex-ensemble* unit characters, the result may be pictured thus:—

The typical human female *sex-ensemble* consists, as already said, of *ovary* with heredity cells—*i.e.* oöcytes; a duct portion, uterus, tubes, and vagina; the urinogenital sinus and external genitals; the mamme; finally, *the secondary sexual characters* as already given (p. 411). There is a maximum of the potent organs, a minimum of the non-potent, and a congruence of the secondary sexual characters. In the atypical female *sex-ensemble*, as I have already shown, the potent duct element is not at a maximum, the non-potent are above the typical minimum, and the secondary sexual characters are not entirely congruent. The *sex-ensemble* in both is a probability result, and takes place as follows:—

The Relation of the Sex-Ensemble in its Adult Condition to that of its Determinant Stage: The Sex-Ensemble Molecule.

We must start with two basal facts—

1. The *sex-ensemble* in the typical male and female is a probability result, that is, the duct system is in each at a maximum of the potent and minimum of the non-potent; to this we must add that the secondary sexual characters are congruent.¹⁰

2. The determinant stage of the *sex-ensemble* must thus have a probability arrangement, and this is best understood by supposing that in the determinant stage there is a *sex-ensemble* molecule where this arrangement is attained. Thus in the normal *sex-ensemble* molecule we have the potent determinants at a maximum, the non-potent at a minimum, and the secondary sexual determinants congruent. This typical *sex-ensemble* molecule has arisen at the time of the formation of the p. g. c. mass, is a balanced molecule of positive and negative protoplasmic electrons.

The *sex-ensemble* molecule for the female kangaroo would differ from this in having a greater number of Wolffian-duct determinants with fewer Müllerian, but polar losses have diminished the former and increased the latter relatively, until the human female condition was attained.

In *atypical male and female sex-ensemble* (male and female pseudo-hermaphroditism) we get a different ratio of the duct elements, a diminution of the potent and increase of the non-potent, with non-congruence of the secondary sexual characters,

but I have discussed that in a previous paper and need not recur to it.¹⁰

In inversion of the sex-ensemble we get male elements in the female sex-ensemble and female ones in the male sex-ensemble, that is, we have an invandering of opposite sex-ensemble determinants happening: how does this come about?

It does not happen when the p. g. c. and s. masses are formed, as here we get a probability distribution of male or female determinants and variations of each of these in the *sex-ensemble* molecule, but all within the limits of continuous variation; there is no inversion. We must look elsewhere for inversion of the *sex-ensemble*.

We now go on, then, to consider the facts of *sex-ensemble* inversion.

The Possible Inverted or Invandered Factors in the Male and Female Sex-Ensemble Considered in Detail.

These are practically as follows:—The psychosexual powers, the hair arrangements on the anterior abdominal wall, the mammae, the prostate, the soma, the larynx, the pelvis.

The Psychosexual Powers.

Inversion of these gives homosexuality, that is, sexual inversion. This question will be discussed on two points only—the site and origin of sexual attraction, and its nature. The question of its method of expression and of the treatment of inversion, if any, will not be considered, as that has been fully gone into by expert writers—Havelock Ellis and Krafft-Ebing for adults, Moll for infants and adolescents, and many others too numerous to mention.

The centre for sexuality is probably a cerebral one, but for its complete expression the genital tract, both anatomically and in association with the secondary sexual characters, must be typical.

The dominance of the psychosexual factor is shown by the male invert, who, although often capable of heterosexual expression, prefers homosexuality. In Fibiger's Case II. the internal organs were practically female, but homosexuality was very marked and she was married to a female. In Tuffier and Lapointe's case testes were present in apparent labia, but this male was frankly homosexual and also purely feminine in habits and matters of dress. He, indeed, when dressed, seemed a typi-

cally elegant woman. The homosexuality was therefore purely mental. A consideration of inverts with male or female *sex-ensemble* confirms this view. It seems, therefore, most probable that homosexuality is congenital, and is due to an inversion of the psychic cause of sexual feeling.

I have been unable, however, to find in neurological literature any information as to the localisation of sexual feeling. One cannot ignore cases where the sexual feeling has been perverted and depraved, but any investigation of such cases so as to ascertain their exact nature tends to be unsatisfactory. Cases also have been noted where some sudden mental shock is said to have developed homosexuality, but it may only have stimulated a latent condition.

Freud⁷ has advocated the development of sexual feeling in the infant as a reflex or education from normal sucking or from a stimulation by defaecation, but that this is the case is highly improbable. There are two additional facts observable in very young children that must be considered under this head. There are undoubted phallic erections to be noted in sleeping young boys, but these are probably due to a distended bladder and the dorsal posture in bed. The bladder in the infant is partly abdominal, its apex when full running up higher in Retzius's space than in the adult, and thus traction is exercised on the triangular ligament, causing probably kinking of the return veins, phallic congestion, and erection apart from any sexual cause. Similar erections coming on in the early morning may occur in elderly men with polyuria, and the cause is the same as in the instance just mentioned.

The second fact is that local genital manipulations may be due to the irritation of preputial debris. The prepuce in both sexes develops not as a forward growth of a free skin fold, but in the forward growth the inner surface of the prepuce is blended with the glans, and the ultimate mobility of the prepuce is caused, as I have demonstrated, by a central desquamation of epithelial cells. Thus epithelial debris, retained or not properly extruded, may cause irritation and a natural manipulation by the child. These manipulations may be erroneously interpreted as erotic, but may be stopped by cleanliness. I do not consider Freud's views on this question satisfactory.

Sexual inversion, therefore, seems to me to be due to a distribution to the individual of the opposite psychosexual factor in a way to be discussed presently.

The Hair Distribution on the Anterior Abdominal Surface.—The distribution of hair in the above area differs in the human male and female.

In the *male* the hair runs up in the linea alba and round the mammæ, and is present, though sparser, over the whole anterior surface. It is abundant on the limbs and face.

In the *female* the anterior abdominal surface is not beset with evident hair, except over the pubes, and this runs down over the labia majora. The upper boundary of the pubic hair is transverse, not triangular with the apex upwards as in the male.

Occasionally one can note in women an arrangement of the abdominal hair as in men. It is an evident inversion, interesting from its simplicity, and I have seen it in single and some pregnant women.

In the *mammæ* we may have another instance of inversion, males having large and sometimes functional mammæ, while in the female they may be like those of the male—in an undeveloped condition.

The *prostate* is a characteristic organ in the male. In the human female there is no prostate normally, but a small representative in Skene's tubules, which lie one on each side in the anterior urethral wall, and are large enough to admit a surgical probe. They represent the prostatic glands of the male, and not the vesiculæ seminales, although something can be said for that view. It is remarkable that in all accurately examined cases of atypical female sex (female pseudo-hermaphrodites) a well-developed prostate is present, with either two or three lobes, and that the suprarenals are also much enlarged. In atypical male *sex-ensemble* the prostate is present.

The *larynx*.—The male and female larynx differ, the former being larger and the thyroid cartilages more completely ossified, as is shown by X-ray examination—this in addition to the differences in the vocal cords. In one of Fibiger's cases (No. II.)⁹ the larynx was male although the individual was an atypical female (female pseudo-hermaphrodite). This has been noted in other cases, and adds to the difficulty of clinical diagnosis. Havelock Ellis (*Sexual Inversion*, vol. i. p. 97) quotes Flatau, who, at Moll's suggestion, examined the larynx in 23 cases of inverted women, and "found in several a very masculine type of larynx, especially in cases of distinctly congenital origin." . . . "No masculine character is usually to be found in the sexual organs, which are sometimes undeveloped."

The *pelvis*.—In Fibiger's Case I,⁹ and also in other instances, inversion, partial or perhaps complete, of the pelvis has been found. In Tuffier and Lapointe's case the pelvis seems female although the individual was a male. This pelvic inversion may also occur in normal women and give rise to pelvic deformity. I have two such specimens, but defer the consideration of partial or complete pelvic inversion to a subsequent paper. We see, then, that inversion of the various constituents of the *sex-ensemble* may happen, and the question now arises how such a remarkable phenomenon happens—how is it that a male has female characteristics, and *vice versa*? It is highly probable that this happens in the germ-plasma state—indeed one cannot imagine its occurring at any other stage of development, and I therefore now go on to show that in all probability

Inversion of the sex-ensemble may take place when the sperm- and germ-cells are undergoing mitosis in the sex gland, one of the purposes of this being to divide the sperm-cell into two kinds and the germ-cells also into two such.

The usual opinion as to fertilisation is that there is a male and female reduced cell—a *gamete* on each side—and that the union of these gives rise to a zygote from which a male or female ultimately develops, each with an appropriate sex gland.

The usually accepted opinion of there being one gamete on each side and no more has many difficulties.

1. As a male or female arises from their union they must have between them the potentialities of both sexes in their somatic qualities, and have determinants for two kinds of Wolffian body relics for the somatic part of the ovary or testis. One of these must be got rid of—how, is not explained.

2. Sex-limited conditions such as hæmophilia, special characters associated with sex in insects, are difficult of solution.

3. Inversion of the *sex-ensemble* is not satisfactorily cleared up on the theory of one gamete on each side. If, however, we consider that there may be two gametes on each side, we get a very feasible solution of many difficulties, including the above given in 1 and 2. We may sketch the matter thus:—

(a) There are two kinds of sperm-cells in the testis. One of these, the Wolffian, has the Wolffian determinants necessary to make up part of the somatic equipment of the testis, *i.e.* the connecting tubules between the tubuli seminiferi and the epididymis and vas deferens. This is ultimately the male Wolffian gamete. The determinants for this and the other parts of the

male *sex-ensemble* are contained in a *sex-ensemble* molecule, and this molecule contains therefore all the *sex-ensemble* determinants distributed in it in a probability balanced ratio, and these comprise the potent non-potent, or opposite sex-duct elements mentioned above (p. 410), as well as those for the secondary sexual characteristics. In the other "molecules" of the sperm-cell are contained the determinants for the "soma" and also ancestral determinants.

At maturation, prior to fertilisation, the ancestral determinants are usually thrown off, but in these polar bodies some immediate ones may be present and are thus lost too; while, of course, in the ones retained for the formation of the gamete, usually immediate race determinants, some ancestral ones may remain.

The second sperm-cell, or non-Wolffian one, contains no *sex-ensemble* determinants as a rule, unless some may have inwandered from the Wolffian one, as will be suggested shortly.

In the same way the Wolffian ovum or oöcyte has determinants for the elements of the female *sex-ensemble*, viz. the potent duct elements, non-potent, or opposite sex-duct elements as given above, and the secondary sexual characteristics. The non-Wolffian ovum or germ-cell has no *sex-ensemble* determinants, but the same limitations hold, as given above regarding the sperm-cell.

The somatic determinants for the future body of the individual are also in the Wolffian and non-Wolffian germ- and sperm-cells, and I have already brought forward evidence that the non-Wolffian have the somato-pleuric determinants, the Wolffian the splanchno-pleuric (see *Edin. Obstet. Trans.*, xxxiv. 303). When the germ- and sperm-cells mature, that is, lose their polar bodies, *i.e.* half the chromosomes, usually ancestral ones, we then get Wolffian and non-Wolffian gametes, two on each side, and these form the zygote at fertilisation, a male one or female one.

How and Where, then, do the Double Sperm- and Germ-Cells Arise?

The source of origin for these double sperm- and germ-cells must be sought for in the germ-plasma, in one of the various changes that occur in it—(a) in the formation of the primitive germ- and sperm-cell masses; (b) when the germ- or sperm-cells are travelling through the germ layers to reach the sex gland; (c) in the sex gland itself.

We may exclude any idea of their formation at maturation.

(a) *In the Formation of the Germ- and Sperm-Cell Masses.*—At this time these masses are formed by a probability distribution of the determinants, in one for the future soma, and in a second for the future sperm- and germ-cells. In this way we get a probability distribution for the immediate soma and for future generations. There is, however, no division into two kinds of sperm- and germ-cells.

In (b), when these cells are travelling in the embryonic germ layers, practically no mitoses take place, and thus this is probably not the time of the double formation.

It is to (c), in the mitoses taking place so abundantly in the primitive oöcytes of the fetal ovary, and in the sperm-cells, that we must look for the double germ- and sperm-cells, and this phase in the germ-plasma must now be considered.

I think it probable that in the mitoses of the primitive ova in the sex gland we get their multiplication and division into the two kinds of ova I have already alluded to, and that thus the Wolffian and non-Wolffian oöcytes arise. While each variety is probably pure in its structure, variation is present, and thus we might get a Wolffian ovum with some of the Wolffian ovum determinants of the *sex-ensemble* absent, e.g. those for the ilium. In this way if it met a non-Wolffian sperm-cell in fertilisation with ilium determinants present as a variation, the *sex-ensemble* of the new female zygote would contain male *sex-ensemble* determinants for the ilium, i.e. they would be inverted.

Thus for a *normal female sex-ensemble* there would be a Wolffian ovum with, *inter alia*, determinants for the female *sex-ensemble*, meeting a non-Wolffian sperm-cell with no male *sex-ensemble* determinants.

In an *atypical female sex-ensemble*, with a male ilium, we would require a Wolffian ovum without ilium determinants as a variation, meeting a non-Wolffian sperm-cell with the variation of the presence of ilium determinants, and thus the pelvis of this female would be inverted as to the ilium. Thus on the one side there is an opposite *sex-ensemble* determinant *missing* in the Wolffian female gamete, and an opposite *sex-ensemble* determinant, that for the ilium, *present* in the non-Wolffian male gamete, where it normally should not be. This may be put as follows:—

For an inverted ilium—male for female—Wolffian female gamete *minus* ilium determinants fertilised (×) by non-Wolffian gamete *plus* determinants for ilium. In each case the determinants omitted are placed in the wrong gamete.

The Method of Investigation Employed in the Present and Two Previous Papers.

It will be convenient here to consider the method of inquiry used in the present and two previous papers,^{9, 10} as such investigations have been often carried out on too limited lines.

In the first place, the facts have been mainly taken from the genital anatomy of the human male and female. This is much better known than in any other member of the animal kingdom, and we know what I have termed the *sex-ensemble* incomparably better than in any other species in zoology. In most researches the question of *sex-ensemble* is not considered at all, and, often erroneously, sex is considered to be due to some feature in it quite apart from the sex gland itself. The human male and female *sex-ensemble* are quite distinct, and consist of a sex gland, a potent duct system, an opposite sex-duct and degenerated element, with a congruent secondary sexual system. The opposite sex-duct element is of supreme importance if one wishes to understand here the typical human *sex-ensemble*.

The typical *sex-ensemble* in the human male and female can be seen to have a maximum of the potent, a minimum of the non-potent, and a congruence of the secondary sexual characters.

We have, further, in the human male and female a very extensive literature on atypical male and female *sex-ensemble*, ordinarily called male and female pseudo-hermaphroditism. A study of these conditions has shown me that in such the sex, as rightly determined by the nature of the sex gland, is either male or female, and that the essence of these conditions is a disturbed ratio between the potent and non-potent elements, *i.e.* the potent are diminished, the non-potent increased, and this is accompanied by a non-congruence of the secondary sexual characters. Atypical *sex-ensemble* thus throws great light on the typical.⁹

A very important source of light in sex and *sex-ensemble* conditions is shed by teratology. In deformed conditions of the human fetus we have not only a fascinating subject of study, but one that more than in any other part of the animal world is extensively investigated, and supplies many important sources of information.

In the early processes of development and those prior to and at fertilisation we have a very large series of facts to draw from, and these may be considered in the following order:—(a) The formation of the primitive germ-cell and sperm-cell masses; (b) the origin of the primitive germ- and sperm-cells; (c) the

formation of the gametes, the reduced sperm- and germ-cells; (*d*) mitoses in the oöcytes and sperm-cells of the sex gland; (*e*) the light thrown by molecular physics on (*a*)-(*d*); (*f*) the probability mechanism in all these processes.

(*a*) *The Formation of the Primitive Germ-Cell and Sperm-Cell Masses.*—When the zygote is formed at fertilisation a part is early set aside for the soma of the future individual and a part for the p. g. e. or s. mass, the origin of the future germ- and sperm-cells. The former has the power of developing and uniting the unit characters making up the adult, while each of the latter remains in the determinant condition, ready for maturation and fertilisation. This has been distinctly traced in insects (Balbiani, Hegner), and in the ascaris, especially by Boveri, and we thus see that the future sperm- and germ-cells have the continuity of the germ-plasma, as Galton, Jäger, and Weismann so brilliantly foresaw.

(*b*) *The Formation of the Germ-Cells and Sperm-Cells.*—As to the origin of these, we have the gonotome origin of Rückert, the germ epithelium origin of Waldeyer, and the early zygotic origin as given in (*a*).

Rückert's theory as to their origin from a mesoblastic segment is now given up.

Waldeyer's theory¹⁵ has, however, had a greater vitality, and from its simplicity and histological backing it long retained and still retains many adherents. We know that on the early Wolffian body a special thickening of modified cölonic (peritoneal) epithelium is formed, and that this covers the early sex gland, although also found in the adjacent peritoneum. In the germ epithelium and in the early sex gland are found primitive ova, undergoing mitotic division, and it was held by Waldeyer and his followers that these primitive ova were derived from the germ epithelium, *i.e.* arose from somatic cells. Clearer views of heredity and Weismann's continuity of the germ-plasma shook this, but what did most to overthrow it was the following:—Waldeyer examined the sex gland alone, but when serial sections of the entire developing organism in its germ layer stage were made, a new light was thrown on the matter, as primitive germ-cells were found in the germ layers before even the germ epithelium and sex gland were laid down, and it was then found that they were travelling by a distinct germ path through these layers, and ultimately reached the sex gland later, to undergo mitoses there.

There has been abundant confirmation of this migration by many observers—Allen, Lewis, and Swift¹⁴ of America, Rubaschkin of Moscow, and by Germans too numerous to mention. Beard, in this country, has been a pioneer whose work has been most outstanding; Owen, Nussbaum, and Eigenmann were the earliest observers.

The structure of the travelling primitive germ-cells is most striking when treated with appropriate preparation and staining. Its rounded or oval shape, size of about 14 mikra with the black yolk plates, make it stand distinctly out from tissue cells. Its nucleus is large—8 to 12 mikra—and has usually two masses of chromatin. Its attraction sphere, cytoplasmic, rests on the nuclear membrane on the side of the nucleus farthest from the cell membrane. According to Rubaschkin¹² the mitochondria are granular and not rod-like as in somatic cells, but Swift disagrees with this. Felix, in Keibel and Mall's *Embryology*, attaches importance to the granular state of the mitochondria.

Primitive germ-cells have been noted in the human germ layers by Ingalls and Fuss, and in the chick, rabbit, etc., by many observers.

They travel through the layers by amœboid motion, although some hold that this is only apparent and simulated by the growth of the germ layers. The amœboid travelling is, however, undoubted, as has been shown by Mlle. Wera Dantschakoff¹ in a paper on the "Development of the Blood in Birds." This observer described in the blood-vessels large inwandering cells, as she termed them, and believed them to form blood-vessels. As Swift points out,¹⁴ they are really primitive germ-cells which have in their migration entered blood-vessels. Thus they travel not only through mesoblast but pass into and emerge from blood-vessels. To this we must add that mitoses in the travelling germ-cells are rare. These observations help us to understand the occurrence of teratomata in the sex glands and tissues. They may be primitive germ-cells which have become arrested in capillaries and undergone transformation by a rare mitosis into the two varieties of sperm- and germ-cells. One finds dermoids where all the germ layers are more or less represented, but occasionally we get quite a recognisable anterior segment of a fœtus—body, peritoneal cavity, rudimentary limbs and segment of bowel as in Cullingworth's case recorded by Shattock (*Lancet*, 1908, p. 497).

The early zygotic origin of the primitive germ- and sperm-cells and their migration to the sex gland has thus been un-

doubtedly proven to the hilt, although, of course, their early career prior to the formation of the germ-layers is as yet unknown, unless in insects and worms.

Space prevents discussion of other points, but the literature given may be consulted.

It is remarkable that in our own literature the recognition of this view has been exceedingly slow and grudging, and in making this remark I include myself among the belated, although I was always greatly impressed by Beard's work.

Thus Miss Lane Claypon⁶ practically accepts Waldeyer's theory and von Winiwarter's results, and derives follicle cells, interstitial cells, and true ova from the germinal epithelium. Miss Louise M'Iroy has practically the same view. Starling derives the primitive ova from the germ epithelium, and F. W. Mott¹¹ accepts this view. If this is accepted one may bid farewell to all hope of understanding heredity.

(c) *The Formation of Gametes, the Reduced Germ- and Sperm-Cells.*—Prior to fertilisation the sperm- and germ-cells lose half their chromosomes (maturation), and thus form the gametes necessary for fertilisation.

This is a most important fact, and has usually and rightly been considered to have the function of preserving the necessary number of chromosomes each fertilised cell possesses.

The loss of chromosomes prior to fertilisation has another and very profound significance which I have already elaborated.¹⁰

In the sexual duct system of mammals we have a change from a complicated duct system, as in the kangaroo, to a simpler arrangement in mammals, especially in the normal human genital tract. Here we have this system fully represented either in its Müllerian or Wolffian side, and when the one is at a maximum the other is at a minimum. This, I believe, is brought about by a series of polar losses, so that ultimately we get the arrangement found in the normal human tract.

In the scheme of evolution-mechanism in past geological time these polar losses are of immense importance, and it is of the greatest interest to consider them in such questions as the evolution of the limbs in horses where successive losses of metacarpal and metatarsal bones have given us in geological time the ultimate limbs as we now find them in *equus caballus*.

(d) *Mitoses in the Oöcytes and Sperm-Cells of the Sex Gland.*—These will only be considered in the case of the oöcyte.

Mitosis is very complicated, but practically we have equal

longitudinal division, transverse division, and a circulation of determinants when there is a closed loop. This means a thorough variation of determinants, and gives rise to continuous variation accompanied with multiplication (see under (b)). The physics of this mitosis will be considered presently.

(e) *The Light Thrown by Molecular Physics on (a)-(d)*; (f) *The Probability Mechanism in all these Processes*.—Weismann's generalisation as to the continuity of the germ-plasma and its causation in the formation of the unit characters making up the "soma" has been of the greatest value, but it requires to be shown how it acts. The recent work of physicists as to the constitution of matter when applied to the mitosis and maturation of the primitive germ-cells seems to me to throw a flood of light on this question.

Living protoplasm as a form of matter may be regarded in its atomic form as a balanced series of electrons,¹⁰ to be considered as matter or as associated with a basis substance, so arranged that we have a balanced set of electrons in equilibrium, as neutral or negative or positive atoms ions according to an excess of electrons (negative) or *minus* an electron, positive.

These electrons are in a whirl and eject electrons, thus forming ions.

In mitosis we get equal division, longitudinal and transverse, the divided segments being unlike in their electrical charge; or repulsion when they are like—electricity is *one*—the positive and negative conditions being due to an electron in excess (negative) or one wanting. In the closed loop we have a circulation of determinants and a distribution by a probability mechanism.

In electrical discharges through gases we get ejection of electrons from the atom, and this goes on constantly in radium. We may regard the loss of the polar bodies as an ejection of electrons from the nucleus.

More recently a modified statement of the above views of the physicist has been given, and the following extracts from J. Newton Friend's text-book of *Inorganic Chemistry*⁷ (vol. i., pt. i., by Friend, Little, and Turner, p. 276) gives a clear account of the question:—

"According to the modern view of atomic structure, an atom consists of a central core or nucleus of very small dimensions in which practically all the mass of the atom is concentrated, and a number of electrons arranged in layers round the nucleus and extending from it to distances comparable with ordinarily accepted

mass of the atom. There is but one kind of electron common to all kinds of matter; it carries a charge of electricity termed the unit charge, and its mass is about $\frac{1}{1836}$ of that of an atom of hydrogen. The nucleus of a neutral atom carries a positive charge equal to the sum of the charges on the surrounding electrons; but although the nucleus carries a net positive charge, it may contain negative electrons within its charge. When a radio-active atom undergoes disintegration the α and β particles it emits are considered to come from the nucleus. . . . The electrons in the outer layer are considered to be held in position less firmly than the others. They are mobile and arrange themselves easily under the influence of forces exerted on them by other atoms, and some of them may be detached from the atom and transferred to another. . . . The electrons in the inner layer, however, are much more firmly held, and are little affected by the proximity of other atoms."

This is the physical picture of the atom, but if we substitute "determinant" for "atom" we get a similar description of what goes on in mitosis and maturation. The greater instability of the outer layers of electrons as compared with the nucleus has a very special bearing on ancestral and immediate determinants. It is probably the ancestral determinants that are thrown off as the polar bodies, and we may thus suppose that they are in the outer layer of electrons while the immediate ones are more firmly held in the nucleus.

We can thus surmise that in the protoplasmic determinant we have a core of immediate, and a surrounding system of ancestral atoms, and that, as in the atom of the physicist, it is the outer that is more likely to be thrown off. In this way we arrive at a fundamental conception of the progress of evolution—a retention and a throwing off of determinants in accordance with the modern physical conceptions of matter constitution.

The "molecule"—the "*sex-ensemble* molecule" for instance—may be considered as a balanced arrangement of atoms undergoing like changes, and the typical and atypical *sex-ensemble* molecules would arise.

All molecular or atomic distributions work under a probability law, as has been shown by physicists in the case of gases and radium, and we may thus suppose that a similar mechanism is operative in the rearrangement of protoplasmic atoms and molecules. We thus get an explanation of the frequency polygon for the massed organs measured by the biometrician. They have a gross probability distribution, because of the molecular prob-

ability distribution of their determinants. This is also well illustrated by the probability results of plant and animal crossings—the 1:2:1 or the 9:3:3! according to whether we have a single or double unit character on each side.

We may thus sum up these views as follows:—

*The Atom of the Physicist.*⁷

“An atom consists of a central core or nucleus of very small dimensions in which practically all the mass of the atom is concentrated and a number of electrons arranged in layers around the nucleus.”

“Although the nucleus carries a net positive charge, it may contain a negative electron within its structure.”

“The electrons in the outer layer are considered to be held in position less firmly than the others.”

Molecular distribution is a probability one.

In radium, particles are continuously ejected.

“The range of effective attraction (of atoms) will also extend to neighbouring molecules.”

These form a suggestive parallel, and should attract the attention of evolutionists to the fact that variation results in the adult must be thought of in terms of atomic and molecular determinants.

Summary of Conclusions in this and Two Preceding Papers.

It will be of convenience to give a summary of the main conclusions arrived at in this and two preceding papers.^{9, 10}

Sex has been defined as due to the nature of the sex gland. The nature of the duct system alone or of the secondary sexual characters does not enter into the strict definition.

The Determinant of the Evolutionist.

The immediate determinants are in the nucleus, the ancestral in the outer layers of electrons.

When the two kinds of sperm- and germ-cells are formed in the mitoses in the sex glands certain determinants may be inverted.

The ancestral determinants are usually thrown off and may be in the outer ring. In reversion the nuclear ones are ejected.

Determinant distribution in the p. g. c. and s. masses is a probability one, and thus the probability distribution of organs in the adult when measured biometrically.

At maturation we get the ejection of polar bodies, usually the ancestral ones, in the outer layer.

Union of gametes with unlike charges.

The *sex-ensemble* should be considered as the proper object of study.

In *typical sex-ensemble* we have a normal sex gland, a developed duct system characteristic for the sex, an opposite sex-duct element in a degenerated condition, and a secondary sexual series of characters congruent with the sex.

The normal duct system should be at a maximum, the opposite sex-duct element at a minimum.¹⁰

In *atypical sex-ensemble* (male and female pseudo-hermaphroditism) the normal sex-duct segments are diminished in number, the opposite sex-duct elements increased, and the secondary sexual characters non-congruent.⁹

The sex-duct elements in typical and atypical *sex-ensemble* are a probability result. It is the increase of the opposite sex-duct elements that is balanced by a diminution of the normal sex-duct elements and non-congruence of the secondary sexual characters. The *sex-ensemble* is determined by the gametic determinants and not at fertilisation; where it is only expressed as to *sex*, it is the gametes and zygote that are male or female. The *gametes* only determine the sex-duct element. It is the *primitive germ- or sperm-cells*, formed shortly after the zygote arises, that, travelling through the germ layers and entering the sex gland, give rise to sex. The nature of the germ-cells in the sex gland, and that of the potent, non-potent, and congruent secondary sexual characters gives the *sex-ensemble*.

What results in the adult is due to intrinsic changes in the germ-plasma of the germ-cell nucleus, and they may be correlated as follows:—

<i>Changes in the Germ-Plasma</i>	{ Give rise } to	<i>Results in the Adult.</i>
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Formation of p. g. c. and s. mass with distribution of determinants in a probability mechanism.

Organism with unit characters whose measurements give a frequency polygon.

Mitoses in chromosomes of sex gland germ-cells.

Continuous variation and formation of double germ- and sperm-cells.

Loss of polar bodies—maturation—and formation of gametes.

Discontinuous variation—mutation.

It will thus be possible to give a mechanism of molecular changes in the germ-plasma causal to the ultimate results in the adult.

Variations, continuous and discontinuous, are thus intrinsic phenomena of the germ-plasma.

No somatic variation due to extrinsic causes can be made causal in the germ-plasma.

Inversion is not merely a psychosexual condition, but any of the units of the *sex-ensemble* may be inverted. It is an intrinsic result, and beyond prevention. The psychosexual form may be amenable to "suggestion."

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CLINICAL STUDIES. IV.—PITUITARY INFANTILISM (FRÖHLICH TYPE); GIGANTISM WITH INFANTILE SEXUAL ORGANS; POLYURIA WITH LESIONS OF THE PITUITARY GLAND.

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THE advances which have been made during the past thirty years in our knowledge of the functions of the ductless glands and of the diseased conditions which result from disturbance of their

function are, perhaps, as striking as any scientific development of our time. These advances have been due, partly to the clinical and clinico-pathological investigations of clinicians in man, partly to the experimental investigations of physiologists on the lower animals. I am correct, I think, in saying that in all cases (with the exception of the testicle, in which Brown-Séguard's observations took the premier place), the clinical observations have preceded the physiological, and the results of disease observed in man by the clinicians have pointed out the way for the more detailed and exact observations of the physiologists.

In making his observations the clinician works under great difficulties. The cases are few and far between; the diseased conditions are often of long duration and have to be watched for many years; post-mortem examinations in cases which have been carefully studied and watched for many years are often not obtained, and even when obtained, the terminal conditions are often so complicated that it is difficult to draw satisfactory and definite conclusions. The observations and investigations of the physiologists are classed, and rightly classed, under the term "original work" or "original research," while the observations of the clinicians, which in many cases are far more difficult and far more laborious, and since they are made in man are of supreme importance, are by many people too often not dignified by these terms, and very often obtain far too little recognition as original scientific investigations.

Amongst the ductless glands the functions of the thyroid, and the diseased conditions which result from disturbance of thyroid function, are best known and most accurately determined. The functions of the pituitary, and the diseased conditions due to disturbance of its function, are, thanks to the investigations of Pierre Marie, Harvey Cushing, Schäfer, and many other observers, beginning to be known. The researches, clinical and experimental, of Harvey Cushing have thrown a flood of light upon our knowledge of this obscure subject. His book, *The Pituitary Body and its Disorders*, is an epoch-making work which contains everything that is known up to date of the subject.

The anterior lobe of the pituitary gland seems to secrete some substance which is actively connected with the growth of the skeleton. Hypersecretion (or, perhaps, perverted), secretion of the anterior lobe of the pituitary gland, seems to be the cause

of gigantism and acromegaly.* Whether this hyper- (or, perhaps, perverted) secretion of the anterior lobe of the pituitary gland will produce gigantism or acromegaly, depends upon the condition of the bony skeleton whether the epiphyses are ossified or not. Gigantism results if the epiphyses are unossified, acromegaly if the epiphyses are ossified, at the time when the disturbance in function of the pituitary body—hyper- (or, perhaps, perverted) secretion—takes place.

Diminished or arrested secretion of the pituitary gland seems to be one cause of infantilism. In some cases of pituitary infantilism the infantilism is of the type described by Lorain and Hastings Gilford; in others, of the type described by Fröhlich. In the latter form, in which there is an excessive deposit of fat on the surface and also in the interior of the body, the posterior as well as the anterior lobe of the pituitary seems to be at fault. The following are the notes of a highly typical case of this kind:—

PITUITARY INFANTILISM (FRÖHLICH'S TYPE).

Male, aged 35.

Previous History.—Up to the age of 5 he was of normal size. Between the ages of 5 and 13 he suffered from attacks of faintness and often felt sick. At the age of 13 he measured 3 ft. 3 ins. in height, and was very thin. Between the ages of 13 and 18 he grew 10 inches and became very fat. Between the ages of 18 and 27 he did not grow at all. Between the ages of 27 and 35 he grew 1 $\frac{1}{2}$ in.

During childhood he had measles and scarlet fever; at the age of 25 he had influenza; and at 26 "shingles." He has never suffered from diarrhoea or other gastro-intestinal disorder.

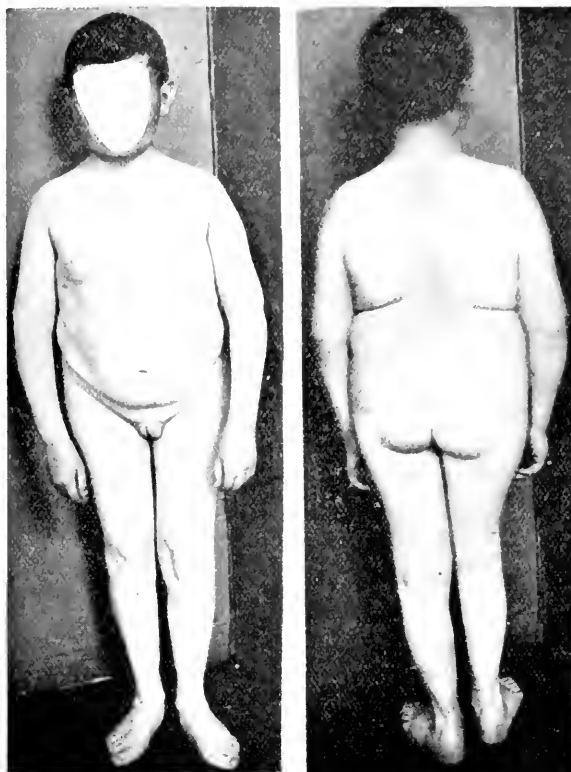
Social Circumstances.—Has a comfortable home; works 10 hours a

* "The disease (acromegaly), in short, is the expression of a functional instability of the pars anterior, doubtless brought about by some underlying biochemical disturbance which leads to the elaboration of a perverted or exaggerated secretion containing a hormone that accelerates skeletal growth (of the long bones if epiphyseal union is incomplete, of the acral parts if epiphyseal ossification has taken place). Since the functional disturbance is probably a fluctuating one, with periods of increase and remission—as is known to be true of hyperthyroidism—epiphyseal ossification may occur during a period of quiescence in the disorder. A subsequent recrudescence, with resumption of the perverted functional activity, will then serve to superimpose acromegalic manifestations on primary gigantism. Acromegaly, in other words, cannot precede gigantism, but always occurs as gigantism which has become acromegalised" (Harvey Cushing, *The Pituitary Body and its Disorders*, p. 252).

day, from 6 A.M. to 6 P.M., with a break of two hours (9 to 10 A.M. breakfast, and 1 to 2 P.M. dinner); earns 24 shillings a week.

Family History.—Good. His father, mother, brothers and sisters are of normal size; indeed, most of them tall, big people.

Present Condition.—Height (naked) 4 ft. 1 $\frac{3}{4}$ in., weight (naked) 5 $\frac{1}{2}$ st. 5 $\frac{1}{4}$ lbs. The face looks old in comparison with the body; it is lined about the mouth. The body is abnormally fat, large masses of fat



FIGS. 1 and 2.—Front and back views of the case of pituitary infantilism described in the text, at the age of 27.

being present in the position of the mammae, in folds below the scapulae, over the abdomen, etc. (see Figs. 1 and 2, which represent his condition at the age of 27). The head measures 20 $\frac{3}{4}$ ins. in circumference, and 13 $\frac{1}{2}$ ins. from the base of the nose to the occipital protuberance. Circumference of the chest at nipples: expiration 31 ins., inspiration 32 ins.; of the abdomen at umbilicus 31 ins. X-ray examination of the head shows a very small sella turcica (see Fig. 3). The fields of vision are normal; in fact rather larger than normal.

The mental functions are normal and acute.

The genital organs are completely undeveloped.

The secondary sexual characteristics are completely absent ; there is no hair on the pubes, in the axillæ, or on the face. The hair of the head is thick and dark. The voice is juvenile ; the skin is soft, fine, and dry.

The hands are short, the fingers not specially pointed. The feet are flat, the toes, more especially the big toes, deflected outwards (hallux valgus), and there is a bunion on each big toe.

X-ray examination shows the epiphyses of the bones of hands, feet, wrists, long bones unossified (see Figs. 4 and 5).



FIG. 3.—X-ray photograph (natural size) showing very small sella turcica in the case of pituitary infantilism described in the text. The outline of the sella is dotted in ink.

The patient's general health is very good ; appetite good ; bowels regular. He sleeps well. Temperature 98° F. Blood-pressure 105 mm. of mercury. Urine normal in amount, specific gravity 1015 ; no albumen, no sugar.

SUMMARY.—A typical case of pituitary infantilism of the Fröhlich type. Age 35, height 4 ft. $1\frac{6}{8}$ ins., weight 5 st. $5\frac{1}{4}$ lbs. Genital organs completely infantile ; all secondary sexual characteristics absent. Mental condition quite normal and bright. No signs of pituitary tumour ; fields of vision normal ; sella turcica very small. Epiphyses of the bones ununited. Urine normal.

Temperature normal (98); blood-pressure low (105 mm. of mercury).

COMPLETE ABSENCE OF SEXUAL DEVELOPMENT WITH GIGANTISM.

The functions of the different ductless glands seem to be in some degree related and interdependent. The relationship



FIG. 4.—X-ray photograph of hand in the case of pituitary infantilism described in the text, showing unossified condition of the epiphyses. (Reduced from 6½ ins. to 4 ins.)

Dr. Edmund Price, who kindly took the photographs, reports that the non-fusion of the epiphyses represents the appearance generally found at the age of from 15 to 18 years.

between the pituitary, on the one hand, and the testicle or the ovary, on the other, seems to be particularly close. It is well known that castration before the development of puberty is followed by elongation of the skeleton, and it has been suggested that this is due to over-action of the anterior lobe of the pituitary gland. On this point Harvey Cushing states :—“Hypophyseal

hypertrophy secondary to castration is well known (Fichera, Tandler and Gross, Rössle), and the length of limb acquired by the preadolescent eunuch is, in all likelihood, a consequence of this expression of glandular interrelation." * . . . "So far as I am aware, there is only one certain experimental method of inciting skeletal



FIG. 5.—X-ray photograph of bones of the leg in the case of pituitary infantilism described in the text, showing unossified epiphyses. (Reduced from $0\frac{1}{4}$ ins. to 4 ins.)

Dr. Edmund Price points out that the shafts of the long bones are abnormally transparent to the X-rays, indicating a delayed deposit of lime salts.

overgrowth, namely, by early castration, and it is probable, after all, that, as Tandler suggests, the skeletal elongation characterising eunuchism is merely an expression of a secondary hypophyseal hyperplasia." †

* *The Pituitary Body and its Disorders*, p. 178.

† *Ibid.*, p. 248.

The secondary sexual characteristics seem to be due to the internal secretion of the testicle in the male and the ovary in the female.

Cases are occasionally met with in which the genital organs are completely undeveloped, the secondary sexual characteristics completely absent, but the subjects giants. These cases are, I think, very difficult to explain. Diminished or abolished secretion of the pituitary gland would account, in such cases, for the non-development of the sexual organs and (because of the non-development of the sexual organs) for the absence of secondary sexual characteristics; but if the gigantism in cases of this kind were due to over-action (or perverted action) of the pituitary gland, one would have to suppose that the function of the gland (anterior lobe), which was at first diminished or suppressed, afterwards became increased; and if this were so, why did not the genital development occur in association with the elongation of the skeleton? An explanation which suggests itself is that the testicular non-development was the first event and that the elongation of the skeleton was secondary to it—similar to the elongation which occurs in man and animals after castration before the occurrence of puberty; this, as has already been stated, is supposed to be due to hyper- (or perhaps perverted) secretion of the anterior lobe of the pituitary gland. Why, if this theory is accepted, the testicular development was arrested—in other words, what is the primary cause of the condition in these very rare and interesting cases—there is nothing to show.

The following is a remarkable case of complete arrest of the sexual development and complete absence of secondary sexual characteristics with gigantism. In it there was no naked-eye lesion of the pituitary gland. (I cannot as yet, unfortunately, say anything regarding the microscopical appearances.) I regret, too, that I have no note of the condition of the pineal gland. It is well known that in some cases of pineal gland tumour there is not only an excessive development of fat on the surface of the body, but a premature genital and sexual development. It has been supposed that this condition is due to hyper- (or perhaps perverted) secretion of the pineal gland. Now, if this is so, one would expect that diminished or arrested growth of the pineal gland would produce infantilism. So far as I know, no cases of pineal infantilism have as yet been described, and Harvey Cushing states:—"Experimental studies have as yet disclosed no definite physiological properties, either by injections or by extirpation

methods, a number of successful epiphysectomies by Exner and Boese having shown negative results; and in our own experiments, if there are any symptoms produced by a pineal extirpation they have so far eluded us."*

Some writers would term this a case of infantilism, basing their diagnosis of infantilism upon the non-development of the sexual organs. This is, I think, a mistake. An individual whose stature is gigantic should not, in my opinion, be classed as a case of infantilism.

Again, some writers draw no distinction between dwarfism and infantilism; this also, in my opinion, is a mistake. In persons affected with achondroplasia the sexual organs are fully developed, and, as in the case of the late "General Tom Thumb," they are capable of propagating their species. Such cases should not, I think, be included under the term infantilism.

The term infantilism should, in my opinion, be limited to cases in which the genital organs and secondary sexual characteristics are undeveloped, and in which the stature is that of a person before the age of puberty.

The mental condition in cases of infantilism of this kind necessarily varies. In some cases, such as cases of sporadic cretinism, the mental condition is defective. In my experience, even if as the result of thyroid treatment such patients grow to a normal height and reach full development as regards the sexual organs, they remain more or less (if the sporadic cretinism was severe) mentally peculiar or defective.

In other cases of infantilism, such as the case of pancreatic infantilism, which I described in the last number of this *Journal*, and the case of pituitary infantilism described above, the patients are mentally quite bright and active. Their mental condition necessarily does not correspond to that of an individual before the age of puberty, but to that of an individual who, being mentally normal at the age of puberty, has developed mentally since the age of puberty in accordance with his education, environment, and experience, whatever these may happen to have been.

In the case of pituitary infantilism described above, the patient, who is 35 years of age, and has been able to earn 24s. a week, has, since the age at which puberty ought to have been developed, that is to say for 20 years, naturally acquired a very different outlook, training, and experience from a boy aged

* *The Pituitary Body and its Disorders*, p. 228.

10 or 12, to whom, as regards sexual and bodily development, he corresponds.

CASE OF COMPLETE ABSENCE OF SEXUAL DEVELOPMENT WITH
GIGANTISM.

J. G., aged 50, travelling poet, was admitted to Chalmers Hospital, Edinburgh, on 21st July 1913, complaining of general weakness, palpitation, shortness of breath, and swelling of the feet.

Condition on Admission.—On examination, mitral stenosis and regurgitation were found to be present. The pulse was quick (100 per minute), irregular, and of low tension. There was some fluid in the abdomen and in each pleura.

Progress of the Case.—Under digitalis considerable improvement took place. On 27th July 1913, at 9 A.M., the patient stated that he felt very well; at 11 A.M. he had a sudden attack of heart failure with breathlessness and cyanosis; at 11.10 A.M. the pulse could not be felt. Artificial respiration and hypodermic injections of strychnine were employed without avail; the patient died at 11.30 A.M.—six days after admission to hospital. The sudden death of the patient, which was quite unexpected, unfortunately prevented photographs and X-ray pictures being taken; while he was under observation he was too ill to permit of this being done.

The cardiac features of the case were interesting, but it is not my present purpose to refer to them. My object is to describe the general condition of the patient, which was that of a giant with complete absence of sexual development and of all secondary sexual characteristics.

The *history* of the case is as follows:—The patient stated that up to the age of 20 he enjoyed normal health. He had, he thought, the usual diseases of childhood. At the age of 20 he began to grow too quickly; soon afterwards he strained his back while lifting a heavy weight, and since then he had never been fit for heavy manual work, and had never been very active. He had occasionally had rheumatic pains in the shoulders, hips, etc. At the age of 25 he had a severe sore throat; with this exception he had had no serious illness.

Eight years ago he tumbled down a flight of stairs and struck the back of the chest severely; after lying for some time unable to rise, he was able to crawl with the help of some railings to the house of a doctor, who treated him for the pain and uneasiness in the chest. For several weeks after this injury he suffered from pain in the chest, and palpitation on exertion. At the end of two months he was quite free from any discomfort, and was able to walk from Glasgow to Aberdeen. He continued to tramp the country until January 1913, when the pain in

the chest and palpitation returned. About this time he had to stop frequently in the street and sit down or hold on to railings for a minute or two before he could go on again. Three weeks ago he became very short of breath, and his feet swelled.

Family History.—His father died at the age of 68 of heart disease; his mother is alive and well; one brother and six sisters are alive and well; one sister died at the age of 35 of Bright's disease. All the members of the family are of normal stature.

Condition of the Patient.—Height, 6 ft. 3½ ins.; weight, 11 st. 7 lbs. Body well covered with fat. Manubrium sterni prominent; considerable scoliosis, convexity to the right. Pelvis distinctly broadened. Fingers long and tapering; some thickening of the joints; fingers of both hands deviate towards the ulnar side. Double genu valgum and hallux valgus, with a tendency to the formation of a bunion on the first metacarpo-phalangeal joint of each foot.

The facial appearance of this patient closely resembled that of a case of *pseudolescent hyperpituitarism with giant overgrowth* described by Harvey Cushing (Case XXXII., p. 162, *The Pituitary Body and its Disorders*).*

The measurements of the different parts of the body were as follows:—

Head, circumference,	22½ ins.
Humerus, right,	17 ins. ; left, 17 ins.
Radius and ulna, right,	12½ ins. ; left, 12½ ins.
Thumb,	5½ ins.
Fingers (from wrist to tip of middle finger),	right, 9¼ ins. ; left, 9¾ ins.
Femur, right,	23 ins. ; left, 22 ins.
Tibia, „	19 ins. ; „ 19 ins.
Foot, „	8 ins. ; „ 8 ins.
Big toe, „	3½ ins. ; „ 3¼ ins.

Complete absence of sexual development. The penis was less than 2 ins. in length, the scrotum very small, the testicles soft and undeveloped. The genital organs looked like those of a boy of 9 or 10.

Complete absence of secondary sexual characteristics; no sexual hair on cheeks, chin, pubes, or axillæ; a fine down on the upper lip,

* In his remarks on that case Cushing states: "It is interesting that, apart from their great stature, many of the giants pictured in medical literature present a marked similarity of feature, which gives them a peculiar 'family resemblance,' almost as striking as that possessed by most acromegalics. Thus an example has recently been recorded by Lemos, and the giant Lopes of his report might well be taken for the younger brother of this giant, John Turner."

on the pubes, and in the axilla. The skin was delicate in colour and texture; the voice was high-pitched, like that of a child.

Intelligence unsatisfactory; the mental condition was distinctly deficient. The patient was restless, continually getting up out of bed (probably owing to the cardiac and pulmonary difficulties). The acuity of vision was normal, the fields of vision normal.

The urine was normal, about 20 ozs. *per diem*, sp. gr. 1025; no albumen, no sugar.

POST-MORTEM EXAMINATION. — This was made by Dr. Murray Lyon on 28th July 1913.

Subcutaneous fat abundant. Abdomen contained 2 pints, the left pleura 1 pint, and the right pleura $\frac{1}{2}$ a pint of clear serous fluid.

Heart enlarged and uniformly thin-walled. Marked mitral stenosis (only admitting one finger). Auricles dilated and thin-walled; ventricles slightly hypertrophied, especially the right.

Spleen slightly enlarged; substance very firm with small hæmorrhagic points, containing a large recent infarct.

Kidneys slightly enlarged and congested; recent infarcts.

Suprenals rather larger than normal, but very thin.

Thyroid small, especially the right lobe. Several small glands (! parathyroids) near the lower pole.

Penis and scrotum like those of a child. Bodies of the testes very small.

Medulla of bones consists almost entirely of fat.

Head. — Skull cap thickened along sutures. Dura abnormally adherent to vertex; not thickened. Posterior clinoid processes abnormally developed. Numerous large roughenings on the petrous portion of the temporal bones.

Pituitary body not enlarged.

Brain, pituitary body, suprenals, testes, and thyroid removed for subsequent examination.

A microscopical report has unfortunately not been obtained. Dr. Murray Lyon, who made the post-mortem examination, is at "the front."

REMARKS.—The interest of this case consists in the presence of complete absence of sexual development with overgrowth of the body—gigantism, and the absence of any naked-eye lesion of the pituitary gland.

POLYURIA IN CASES OF PITUITARY DISEASE.

Clinicians have for long known that lesions in the situation of the pituitary body are apt to be attended with an excessive development of the subcutaneous fat, and with polyuria and glycosuria. I directed attention to this fact in my book on *Intracranial Tumour*, which was published twenty-seven years ago (May 1888).

In describing the symptoms which result from tumours in the anterior region of the base of the brain I stated (p. 164):—

“Tumours of the pituitary body are in many instances attended with an excessive development of the subcutaneous fat, and in some cases with the presence of sugar in the urine, or with simple polyuria (diabetes insipidus). Whether these symptoms are due to the fact that the pituitary body itself is diseased, or whether, as seems more likely, to the secondary results which tumours in this situation produce in the surrounding cerebral tissue, has not yet been decided. Possibly, as Rosenthal has suggested, the diabetes which is sometimes present may be the result of secondary changes produced in the grey matter of the floor of the fourth ventricle. He supposes that the pressure of the tumour first produces irritation of the grey matter lining the third ventricle, and that this irritation travels along the grey matter which connects the third and fourth ventricles and produces secondary changes in the latter.”

From this statement it will be seen that twenty-seven years ago I was well acquainted with the fact that tumours in the region of the pituitary body are apt to produce polyuria and sometimes glycosuria, but that I then left it doubtful whether the polyuria (diabetes insipidus) and glycosuria, which are apt to be present in cases of pituitary tumour, are due to the lesion of the pituitary body itself or to secondary changes produced, as Rosenthal had suggested, in the grey matter of the floor of the fourth ventricle. Schäfer and others have recently shown that injections of pituitary extract in animals produce marked diuresis.

I have met with several cases of pituitary tumour and syphilitic gumma in the region of the pituitary in which polyuria was a prominent symptom. I append references to four cases which I have published illustrative of this point.

CASE I.—*Large Tumour of the Pituitary Body; Polyuria, etc.* (recorded in my *Clinical Studies*, vol. iv. p. 331).—This patient was seen in consultation with the late Dr. Foulis on 17th October 1890. She died on 3rd December 1890. Post-mortem examination showed a large tumour of the pituitary body (see Fig. 6).

The urine was very abundant; it contained a large quantity of phosphates.

CASE II.—*Syphilitic Gumma in the Region of the Pituitary Body* at, , *Polyuria; Recovery* (recorded in my *Clinical Studies*, vol. iv. p. 337).—cal—
Female, aged 34, admitted to the Edinburgh Royal Infirmary ^{cal} 7th October 1893; complete recovery under treatment. nos

In this case the amount passed was excessive—100 ozs. *per diem*. ^{r, ar} The urine was pale; sp. gr. 1010; no albumen, no sugar, no phosphates. ^{rot} s.

CASE III. — *Secondary Sarcomatous Deposit involving the Pituitary Body and Infundibulum; Marked Diabetes insipidus* (recorded in my *Clinical Studies*, vol. viii. p. 179).—Male, aged 55, admitted to the Edinburgh Royal Infirmary on 21st August 1908, suffering from a sarcomatous tumour in the left groin and symptoms indicative of an intracranial tumour (probably secondary sarcomatous deposit) in the

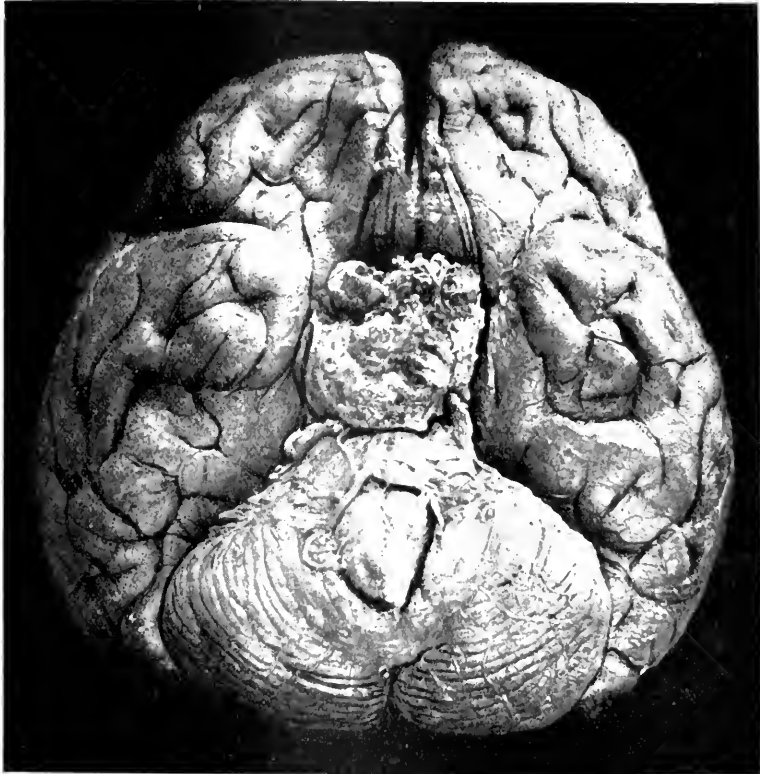


FIG. 6.—Base of the brain in Case I, described in the text, showing a large tumour of the pituitary body pressing on the optic chiasma.

region of the pituitary body. The diagnosis was verified post mortem (see Fig. 7).

In this case patient complained of excessive thirst, and noticed before admission to hospital that he was passing a large quantity of water. Shortly before his admission to hospital the urine was measured; it amounted to $11\frac{1}{2}$ pints in the twenty-four hours. After his admission he suffered from frequent and severe vomiting, large quantities of fluid being ejected from the stomach. This no doubt accounted for the diminished quantity of urine which he passed while

in hospital—72 to 100 ozs. *per diem*. The urine was pale in colour, acid in reaction, sp. gr. 1007; no albumen, no sugar.

CASE IV.—*Syphilitic Gumma in the Region of the Pituitary Body, with Complete Paralysis of both Third Nerves, Polyuria, etc.* (recorded in my *Clinical Studies*, vol. viii. p. 268).—Male, aged 34, admitted to the Edinburgh Royal Infirmary under my care on 27th January 1909.

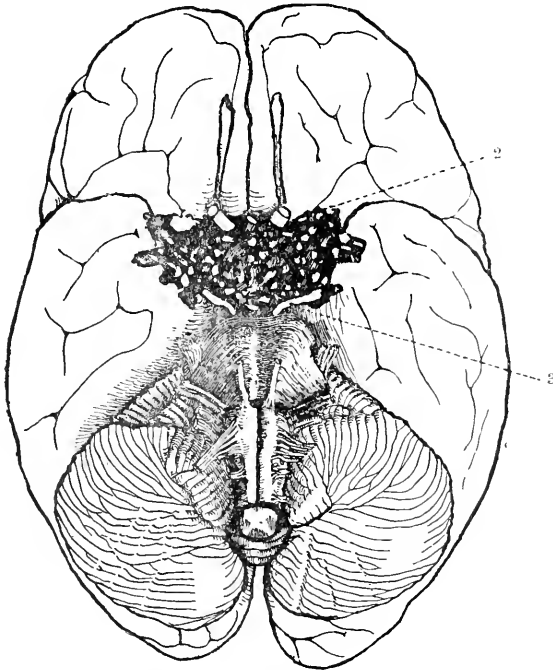


FIG. 7.—Base of the brain in the case of secondary sarcoma of the pituitary body (Case 111.) described in the text; figure 2 points to the second, and figure 3 to the third nerve.

Under treatment (large doses of iodide of potassium, gradually increased from 5 to 90 grains, three times daily) complete recovery took place.

The patient complained of great thirst, and stated that prior to admission he had been making an unusual amount of water. After admission the urine averaged 100 ozs. *per diem*; it was very pale in colour, sp. gr. 1007, and contained no albumen or other abnormal constituent. The skin of the face was very dry and scaly.

THE NEW PSYCHIATRY.*

By W. H. B. STODDART, M.D., F.R.C.P.(London).

LECTURE III.

APPLICATIONS AND RESULTS.

BEFORE proceeding to the main subject of this lecture, "the applications and results of modern psychological discoveries in and therapeutics of the various neuroses, psycho-neuroses and psychoses," I wish to mention another important psychological mechanism which often serves as an indicator of repressed complexes, not only in nervous disorder, but also in every-day life. I refer to "projection."

The peculiarity of this phenomenon is that effects of the repressed complex are attributed by the individual possessing it, not to himself, but to some other person. A few examples will explain my meaning. People who are guilty of some failing, imperfection, or weakness, of which they are ashamed, are exceedingly liable to attribute the same fault to others. If a thief loses an article his first thought is that somebody has stolen it from him, and the man who is ever ready to disbelieve any statement made to him is himself a person who is habitually economical of the truth. The dishonest financier is always on the alert lest somebody should swindle him, and he is exceedingly intolerant of anybody who succeeds in doing so. The man who is unfaithful to his wife is usually suspicious that she may have been unfaithful to him, and how often have we all heard an asylum patient declare that his wife is insane, or a drunkard accuse his consort of insobriety. Self-reproach is so unpleasant to consciousness that it is repressed and sublimated into reproach of other people.

The mechanism of projection is common in many forms of insanity. I remember a patient who travelled all over England in search of an imaginary lady whom he supposed to be in love with him, the real truth being that he himself had an unconscious desire to get married, and some unmarried ladies at the climacteric have their libido unconsciously fixated on some unfortunate individual, with the result that they think that he has fallen in love with them or is paying them undesired attention.

Hallucinations sometimes arise in this way. The patient,

* The Morison Lectures, delivered in the Royal College of Physicians, 8th, 10th, and 12th March 1915. (Abridged.)

instead of accusing himself of some fault, refuses to acknowledge to himself that he possesses it and believes that other people are accusing him, the hallucinations being in reality symbolised self-reproaches.

I now propose to discuss various matters that have been elucidated by psycho-analytic methods respecting the neuroses, psycho-neuroses, and psychoses.

Freud recognises two neuroses proper, viz. neurasthenia and the anxiety neurosis. Probably a few cases of hypochondriasis are due to the same etiological factors as these neuroses, and should therefore be included in the same group.

Neurasthenia is a term which hitherto has been used very loosely, and the separation of the anxiety neurosis as a distinct disease is due to the clinical insight of Freud. The term "neurasthenia" is now limited to a class of case which exhibits very definite symptoms, the chief of which is an undue tendency to fatigue. This is well demonstrated in ergographic tracings from neurasthenic patients. In a normal person such a tracing shows a gradual increase of power at the beginning of the experiment, so that the lever rises more and more with each successive contraction. This is ascribed to the effect of practice. Subsequent contractions remain at the same level before fatigue sets in, when the lever rises less and less until, the finger becoming absolutely useless, the tracing becomes a straight line. With a neurasthenic, on the other hand, the initial increase of power due to the effect of practice is not shown. The first few contractions may be of an average height but fatigue sets in immediately and the contractions become weaker and weaker.

The same phenomenon is shown in experiments devised for the purpose of investigating the laws of mental fatigue. In Weygandt's method, for instance, the patient is given a sheet of paper with columns of figures to be added. He starts on the first column, and at the end of a minute writes down his result so far as he has gone. Then he passes to the next column, adds for a minute, and puts down the result as before, and so on through the whole series. In a normal person, at first the effect of practice is noticeable in that the added portions of the columns get longer and longer until, fatigue setting in, they grow shorter and shorter. In the neurasthenic, on the other hand, the added portions shorten from the very first. Mistakes in the addition also occur earlier than in a normal individual.

The so-called "irritable eye" exemplifies the muscular fatigue, the patient complaining that the eyes ache on reading for a short time, although no error of refraction can be found. Examination with the perimeter soon fatigues the retina and, unless carried out quickly, the visual field will be found contracted or spiral.

These patients are anxious enough to be busy about their affairs like other people; but all effort, mental or physical, leads to an intense feeling of fatigue. In many cases, even the thought of doing anything causes the patient to tremble and to break into a profuse perspiration. Other symptoms are the sense of pressure on the top of the head, often localised in one spot on the left of the middle line, and various paræsthesias, especially of the joints and muscles and the back of the head over the occipital spine. The last is explained as a "crawling" or "screwy" sensation, and was aptly described by one patient whose case was related to me as a feeling as if there were a black beetle inside the skull, lying on its back and kicking to get on its legs again. Feelings of abdominal discomfort also occur, and there may be hypochondriacal notions respecting the genito-urinary apparatus.

Similar symptoms frequently occur in states of general debility, such as chlorosis, and in the early stages of organic nervous disease, such as disseminated sclerosis or general paralysis. In these conditions the case should, of course, not be labelled "neurasthenia," but when the above symptom-complex occurs independently of any other disease, then we have to deal with a case of true neurasthenia.

Now in all cases of this kind, without exception, there is always to be found one essential etiological factor, viz. sexual excess.

Suitable advice and recommendations as to mental hygiene are the proper remedy; but it is often necessary to carry out a certain amount of psycho-analysis in order to trace and uproot the complexes which constitute the foundation of such irregular sexual impulses.

The "anxiety neurosis" is characterised, as its name implies, by a persistent state of anxiety or fear, usually without obvious cause but sometimes initiated by some real cause for anxiety. This state is always out of proportion to its cause, and the other symptoms of the neurosis are exaggerations of the normal physical signs of fear. Such are irregularity and an increased frequency of the pulse, palpitation, anginal attacks, general vasomotor constriction with coldness and blueness of the extremities, dryness

of the mouth, perspiration (especially of the hands), polyuria, diarrhoea, respiratory oppression and air hunger, even attacks of asthma, vertigo, tremor, attacks of ravenous appetite, nausea and sometimes actual vomiting, night terror and insomnia, hyperæsthesia for visual impressions and especially for noises, and a general apprehensiveness.

Such patients are liable to exacerbations of their various symptoms in which the sense of terror may be extremely severe, with a feeling of congestion in the head and a dread of impending death. It is even said that there may be temporary loss of consciousness, but I have not seen such a case.

It may seem extraordinary that a disease with such a wealth of symptoms should not have been recognised before, but it is simply due to the fact that these cases have hitherto been labelled "neurasthenia," a term which possessed the vaguest significance, while the physician remained puzzled.

It is to Freud that we owe the recognition of this disease, and it was Freud who discovered the essential etiological factor. He and all who have subsequently investigated the matter are agreed that the anxiety neurosis owes its origin to an accumulation of mental excitement which finds no somatic outlet, and further, that this excitement is almost always, probably always, of a sexual nature. Accordingly we meet with this neurosis among engaged couples who cannot afford to get married, and in analogous circumstances.

While sexual abstinence in its many forms is the chief cause of the anxiety neurosis, it is not pretended that there are not important contributory factors. Heredity is one, and the condition also arises from overwork and exhaustion, especially after severe illness and prolonged watching by the bedside of a sick relative by night as well as by day.

Unfortunately the obvious remedy for such a neurosis is often impracticable, and it is my custom, in these cases, to seek by means of a short analysis interests of the patient into which his repressed energy may be directed (sublimation of the sexual impulse) and, in the meantime, to prescribe some anaphrodisiac medicine, my favourite mixture for such purposes being a combination of monobromate of camphor with the extract of black willow.

The psycho-neuroses and psychoses are on an entirely different plane from the neuroses. The neuroses, as we have seen, owe their origin to existing causes, probably of a chemical nature, at the time of the malady; but the psycho-neuroses and psychoses

are compromise formations between repressed wishes and the forces which repress them; that is to say, that their mechanism is exactly the same as that of dreams. The obvious differences between dreams and the psycho-neuroses are that in the one the subject is asleep and desires to go on sleeping, while in the other he is awake; and also that dreams are normal while psycho-neuroses are abnormal. Yet even these differences are absolute; for on the one hand certain neurotic symptoms, such as somnambulism, night terrors, and nocturnal paralyses, are definitely associated with sleep, and on the other hand we have to bear in mind the day-dreams of certain hysterical patients. Again, certain anxiety dreams occur in neurotic patients only.

The similarity is therefore closer than appears at first sight, and in both we have exactly the same mechanisms of distortion—the frequent importance of minor symptoms, condensation, transference of the affect, symbolism, somatic displacement, ellipses, inversion, and dramatisation.

One might see a difference in the fact that in the psycho-neuroses and psychoses the patient actually lives his dream; yet even here we must be cautious, for I have known two or three patients whose first symptom was a dream which was believed on waking, and has since remained in the respective patients' minds as a memory of an incident which actually occurred.

Perhaps I may be allowed for purposes of elucidation to take a purely imaginary case of a pretty young girl who, in a household of three persons, acts as the servant and drudge of her two older step-sisters, and is not allowed to appear as a member of the family lest some eligible young man's attentions should be diverted from one of the older sisters to the youngest. Her natural wish is that she should escape such slavery and happily marry some handsome young man of wealth and position; but such a wish has to be brushed aside as impracticable, and it is repressed into the unconscious. If she reads the fairy tale of Cinderella, being a normal person she thinks how delightful such happenings would be if they occurred to her, but she puts the thought aside with the book and resumes her drudgery.

At night her wish escapes repression in a dream in which she herself is Cinderella, and as the midnight hour strikes she awakes to find that it was all a dream.

If, however, she is a psychotic person she may first develop ideas of persecution by her elder sisters and, after passing through a morose period, develop hallucinations of vision and hearing, and

living in a world of her own believe that she is really Cinderella and marries the prince. Ultimately she becomes an asylum queen. Her wish is fulfilled, and she is a case of dementia præcox.

If, instead of this, our patient develops a condition of motor excitement with boastfulness and loquacity, playing all the while with the idea that she is destined to become a princess, but always holding to her relationship with the outside world, she is then a case of acute mania, with every probability of recovery, but subsequently always running the risk of a repetition of such an attack should her environment, or even perhaps a chance remark by association, bring her repressed wish within the realm of consciousness.

Now, let us conceive the relationship between our paradigms to be that of half-sister instead of step-sister, and, being children of the same parent and brought up together, let us suppose that at one time our Cinderella had a certain amount of affection for her half-sisters, and that at some period of her life there may have been a conflict between love and hatred of them. Her love has been repressed, and now her whole affective tone is one of hatred. She has even played with the notion that some fatal accident might occur to them, and that she might thus be released from her unfortunate position. She will not admit to herself that such an idea has ever crossed her mind, and it becomes in turn repressed. In course of time the repression fails, and the unconscious wish reappears in consciousness in a distorted form—let us suppose in an inverted form, so that she suffers from a constant fear that some fatal accident may happen to her. She is the victim of a hysterical phobia, and would be classed as a psychasthenic.

On the other hand, her former love for her sisters may have had such a permanent influence on her mind that her affection is for ever afterwards unconsciously directed towards people of the same sex as they are, the same sex as herself. In other words, she is a repressed homosexual. Her unconscious reasoning then runs thus:—"I do not like men;" this by projection becomes, "Men do not like me," "Men hate me," "I am persecuted by men." She is then a paranoiac.

Lastly, if her mental conflict is now between her repressed wish and an inhibition, she becomes a case of hysteria. Her unconscious wish is to go forth into the world and seek her predestined lover; the inhibition is that she must busy herself about the house and do menial work. A compromise is sought

between the two, and she develops, for example, a hysterical paraplegia, which excuses her both from her work *and* from carrying out her unconscious desire.

I now consider these various disorders in slight detail. The essential characteristic of any hysterical manifestation, as I have just suggested, is that it is a compromise formation between a repressed wish and an inhibition. I desire to lay stress on this as an important point.

There are two varieties of hysteria—*anxiety hysteria* and *conversion hysteria*. The former comprises hysterical phobias, hysterical day-dreams, and what one may call hysterical attacks; the latter includes cases in which the repressed complexes are converted into somatic symptoms.

Phobias or morbid fears may occur in many forms of mental disorder. Hitherto there has been a tendency to refer them all to the obsession or compulsion psycho-neurosis, but psycho-analysis has revealed that they frequently take their origin in a conflict between a repression and an inhibition. As this is one of the characteristic features of an hysterical symptom, we must therefore recognise the existence of an hysterical phobia.

Hysterical day-dreams or hypnoid states are interesting in that they closely resemble ordinary dreams. Brill gives several excellent examples, which I will quote, and he agrees with Freud in stating that they invariably occur in patients who have renounced masturbation and refuse to relieve an over-stimulated sexual impulse.

Three stages of these dreams are to be noted, the first being one of euphoria with fantastic exaltation, the content of which deals with the individual's aspirations; the second a dreamlike withdrawal from reality, in which the patient is no longer controlled by logical reason and judgment; and the third is an absent-minded depressive stage. These three stages correspond with and replace those of masturbation:—(1) Fantastic euphoria; (2) self-absorption and gratification; and (3) depression.

A young woman used to imagine herself married to a handsome, wealthy man. She had three most beautiful children. They all lived in blissful happiness in a magnificent yacht and entertained most charming people. Then the whole structure crumbled. Her husband and children died, and she was left alone in a terrible depression lasting for days.

A young weaver, who thought he was persecuted by his employer, used to think what he would do if he had £400 a

year. He imagined himself starting a shop and earning much money by oppressing his employees. The business grew until he had hundreds of people working for him. He became greater and greater until he found he had lost all his money on the Stock Exchange.

A young journalist imagined himself running a race and winning, when he was struck in the thigh by the spiked shoe of one of the competitors. He is bleeding and his trainers try to stop him but he strikes them aside and runs on, winning the race. Then he collapses exhausted, and is carried off amidst the cheers of the crowd.

A case from Freud. A lady fancied herself in delicate relationship with a piano virtuoso whom she did not know personally. In her fancy she bore him a child. He then deserted her, leaving her and her child in misery. She then suddenly found herself in tears in the street along which she happened to be walking.

Those who are familiar with psycho-analysis will discern the sexual complexes underlying these day-dreams—the desire for marriage in the first and last, the sadistic complex in the second, and the exhibition tendency in the third.

I have said that these hysterical day-dreams are said to occur in patients who have renounced masturbation, but we must go deeper than this to explain the content of the dream, and this leads me to the essence of Freud's theory of hysteria.

Freud's theory of hysteria depends on the recognition of the infantile development of sexuality. Many incidents of sexual import occur during childhood which at the time have no sexual significance, but the recollection of them after maturity is disproportionately exciting, because puberty has in the meantime incomparably increased the reacting capacity of the sexual apparatus. More than twenty years ago Breuer thought that these occurrences were of the nature of gross sexual assaults on the child, but ever since that time Freud has recognised that they are in reality nothing more than commonplace events whose importance is exaggerated by the patient after puberty. I mention this especially because some authors are still keeping up the idea of the infantile psychic trauma which all responsible authorities have abandoned for many years. Ordinary infantile ideas tend to fade with time, but sexual infantile memories are accentuated during normal biological development, and are reinforced at puberty and during later life in a way in which no other experiences are strengthened; but inasmuch as they can then find

no appropriate sexual outlet or reaction, they are repressed into the unconscious, and if particularly strong form an abiding focus of mental irritation.

These unconscious infantile memories influence the whole sexual life of the individual, and in the cases we have just considered are the determining cause of the masturbation. When the repression fails we find that phantasies have been woven round the original experiences, and they reappear as such hysterical day-dreams as I have just related.

These hypnoid states, as they have been called, are subconscious rather than unconscious manifestations of hysteria. Sometimes, however, the phantasies or memories assume an unconscious form and then we have the so-called hysterical attacks. These consist of a series of emotional displays, which are rendered comprehensible when the physician has discovered the underlying thought, for he is then able to see that such emotional manifestations are such as might be expected to occur in response to the given stimulus. They are indeed, as a rule, grossly exaggerated, but they occur independently of any idea in the patient's true consciousness of the situation to which he is reacting. The affective state is entirely dissociated from the situation which gives rise to it. In common with the dream, the hysterical attack represents the fulfilment of an unconscious wish.

Lastly we have "conversion hysteria" which results from a persistent strife between some painful memory and the restraint of the censor from its coming to the surface, the result of the struggle being a compromise whereby the idea by distortion becomes converted into a somatic symptom, some bodily motor or sensory innervation or inhibition.

Probably all of you have heard of Freud's patient who consulted him for an intractable facial neuralgia. By psycho-analysis this was traced to an occasion when she was insulted by her husband. The insult was forgotten, but subsequently appeared in symbolic form as "a slap in the face." The same patient suffered from globus hystericus, which symbolised "I have to swallow that."

In some cases astasia-abasia is symbolic of dependence and helplessness, inability to make headway, having no support, and so forth.

It will have been gathered that psycho-analysis is to be regarded as the most radical form of treatment of hysteria and other functional mental disorders to be presently discussed, but I might refer also to other methods in common use. Weir-

Mitchell's "rest cure" is quite fashionable at the present time, and undoubtedly gives good results in many cases, provided it be used rationally and in combination with some psychical influence at the same time. Suggestion is most commonly used, and Weir-Mitchell's private opinion of the whole procedure was that it acted mainly as a suggestive agency. The prolonged mental and physical rest are beneficial; the removal from home surroundings has the advantage of withdrawing the patient from an environment which has usually proved somewhat irritating; the massage and possibly the electricity tend to improve metabolism, and the overfeeding is well suited to patients who are ill-nourished. Let me say at once, however, that this method is worse than useless in any other condition than hysteria, and, even in this disease, failures are far from uncommon. Moreover, the expense is often as great as in psycho-analysis.

Hypnotism may often be employed with advantageous and often dramatically successful results in hysteria. Hypnosis is much more easily achieved in this disease than in other mental disorders, and it may be used in one of three ways:—

1. To get the patient into an extremely suggestible mood so that suggestion of recovery may be given.
2. To recover buried memories.
3. To get the patient to react emotionally to such buried memories, or, as Freud would put it, to obtain an abreaction to a repressed complex.

The compulsion neurosis is a disease which shows itself in a large number of ways. The patients have clear intellect and good memory, and they are well orientated in time and place, but they suffer from mental symptoms into whose morbidity they have clear insight. They suffer from irrepressible thoughts, which often take the form of metaphysical questionings, such as "When was the beginning of all things?" "What existed before that?" "Who created God?" or they attach undue importance to superstitions; or they cannot help repeating in their mind things they have heard.

Many suffer from morbid fears, fear of open spaces, of closed doors, of heights, of vermin, of broken glass, of pins, knives, and so forth. Others are in fear of blushing under certain circumstances, with the inevitable result that they do blush, or they are afraid that their bowels will act at an inopportune moment, as in church, at a concert, or in the train, again with the not unusual result that their fears become justified.

Then there are the morbid, irresistible impulses in which the patient feels impelled to perform certain acts against his will. As examples, arithmomania, or the impulse to count things, to count one's steps, the rails of a fence, the rungs of a ladder, the windows of a house, etc.; the impulse to read every advertisement or placard one comes across, or even another person's newspapers or letters, the impulse to steal (kleptomania), the impulse to set things on fire (pyromania); certain cases of homicidal and suicidal impulse.

Some authorities regard certain motor agitations, such as the tics, as obsessions. This may be right in the early stages of a tic, but it would be wrong to do so when the tic ceases to be consciously performed.

Some of these patients have feelings of *incompleteness* in action, in intellectual problems, in emotional reaction, and in perception. Others have strange feelings of unreality and of depersonalisation, called by Janet psycholeptic crises.

The unity of this disease has been recognised for many years in spite of its multifarious symptoms. Fifty years ago it was called "volitional insanity," on the hypothesis that the essential basis was a weakness of will-power. Then it was called "obsessional insanity," a term which was justifiable in that it offered no explanation. The mind is obsessed or besieged by such thoughts, fears, or impulses.

Janet advanced a step by recognising what he called a "splitting of consciousness" or "mental dissociation," induced by a "lowering of the psychological tension," the psychical response of a psychasthenic to his environment being inadequate.

Freud regards the compulsion neurosis as a disease of the unconscious. From his laborious investigations on individual psychology by means of psycho-analysis, he interprets the condition on a purely sexual basis, and regards the symptoms as substitutions for certain repressed sexual ideas and emotions. They are due to failure of the repression, whereby the sexual ideas are enabled to find conscious expression in symptom formation. Moreover, two characteristics of these patients have emerged. One is a special aggressiveness during childhood, which mainly shows itself in an intensive activity of the impulse to learn about sexual matters and the mystery of birth; the other is an incessant conflict between love and hatred, a continual existence of these two emotions in the highest intensity, side by side, towards the same persons.

Love and hate cannot, of course, exist together indefinitely, and the conflict is ultimately resolved by one or the other, usually the hatred, being repressed into the unconscious.

In this psycho-neurosis the repressed complex is one of sexual activity, whereas the repressed complex in hysteria is one of sexual passivity.

The form which the disease assumes depends upon whether it is the memory of reproachful acts themselves which forces itself upon consciousness or the memory of the reproach-affect—the emotion of self-reproach. In the first case the feeling tone is merely one of discomfort; if the memory of the reproachful acts had not been distorted, the feeling tone would of course be one of reproach. In the second case the reproach-affect is changed into some other unpleasant emotional feeling, such as shame, hypochondriacal, social, or religious anxiety, fear of being observed or tempted, and so forth. You will easily see that this symbolisation of the reproach-affect renders diagnosis very difficult.

Besides these compromise symptoms there are others which Freud groups together under the name of “secondary defence.” These are protective measures against the obsessions, actions which, if performed at the time of the reproachful action, would have prevented it from occurring. Many patients perform ceremonies which are apparently meaningless until the forgotten action against which they are directed is known.

The patient has no conscious knowledge of the action against which his obsessive acts are directed, and he explains them to himself in some transcendental or abstract thought: (1) an actual occurrence is put in place of a past experience, and (2) something sexual is replaced by something analogous, but non-sexual.

Our conclusion, therefore, with regard to the psycho-neuroses is that an obsession represents a compensation or substitute for an unbearable sexual idea of *very early infancy*, and takes its place in consciousness, whereas a hysterical symptom is the realisation of an unconscious fancy serving as a wish-fulfilment, and it corresponds to the return of a sexual gratification, which was real in *later infancy*, but has been repressed since then, the *obsession* being due to a conflict between a repressed idea and the repressing forces, and the *hysterical symptom* to a conflict between the repressed idea and an inhibition.

Psycho-analysis has proved the only really successful method of treating the compulsion neurosis, but hypnotism may be used

in much the same way as for hysteria, viz. (1) for suggestion; (2) to recover buried memories; and (3) to obtain an emotional reaction to a repressed complex.

Some cases of obsession may be traced, in the first instance, to some forgotten incident to which the patient did not react at the time, with the result that there appears to be a certain amount of latent emotion, floating about free, as it were, and unattached. It then becomes attached to other objects, people, situations, and ideas, so as to give them some unusual and unintelligible significance to the patient. The mechanism is known as "transvaluation."

For example, a patient came across some broken glass in some mashed potatoes she was eating. The occasion was forgotten, but reappeared years later in the disguise of a fear lest poisons in glass bottles should escape and become attached to her person. On account of this, she would never pass a chemist's shop on the same side of the road. Such a patient might have been hypnotised and made to live over again the unfortunate meal, this time reacting with an emotion of terror so that such emotion should not in the future become attached to glass bottles. As a fact she was psycho-analysed, and deeper sources of the psycho-neurosis were discovered.

Dubois' method of treatment by appeal to the patient's reason may be dismissed as grotesque and possessing no novelty, for has not every young asylum medical officer tried to argue with patients that there is no ground for their morbid fears or delusions, and has he not invariably learned that such a method is futile?

"Re-synthesis" and "transmutation" are more rational. For both of these it is necessary that the physician should first devote a considerable amount of time to obtaining a complete history of the patient's life, the ultimate object of the first method (re-synthesis) being to direct the patient's attention to other points of view than he at present takes, and that of the second method (transmutation) being to divert his interests and energies into new channels, these being selected in sympathy with his natural trends. The latter treatment is known in America as "side-tracking," and is really an attempt at what I have already described as "sublimation." Both re-synthesis and transmutation have been characterised as methods of re-education. In re-synthesis some workers, especially of the French school, employ such artificial aids as hypnosis and crystal gazing.

Time will not allow me to discuss these modes of treatment in detail. I must proceed to some consideration of the psychoses.

Maniacal depressive insanity is a disorder in which the patient is liable to attacks of mania, melancholia, or stupor, these being in some cases accompanied with or replaced by some delusional state.

As I have already stated, it is useless to attack this psychosis while the patient is passing through one of these acute phases of the disorder. Radical treatment of the disease must be undertaken during a period of sanity, or, as the populace would say, during a "lucid interval." It is interesting, moreover, that psychoanalysts, who have had experience of these cases, have come to the conclusion that a very short analysis is most successful in effecting a cure, while a complete analysis, in the Freudian sense, only leads to relapse; but, as I said before, many psychoanalysts of experience differ from me on this point.

A case of my own will serve as an example. The patient was married in 1910 at the age of 37. In January 1911 she began to lose flesh and suffered from amenorrhœa, which continued until the beginning of April, when she gradually became more and more excited, and remained in a state of acute mania, from which she recovered at the end of July. Exactly the same series of events took place in 1912 and 1913. In January 1914 she again began to lose weight. She consulted me, and I analysed her for not more than an hour and a half, during which time I discovered a couple of repressed complexes. She afterwards improved in health, had no attack last year, and this year she is doing her ordinary work with no signs of failing health. I regret that I can give no further details, partly because time will not permit, but also for the stronger reason that the patient might be recognised. I can say, however, that the repressed complexes were not of infantile origin.

Dementia præcox has been most carefully studied by Jung from a psychological point of view, and the conclusion at which he arrives is that there is a remarkable psychological resemblance between dementia præcox and hysteria. The complexes and the mechanism of their repression are exactly the same, yet hysteria is an eminently curable disease, while dementia præcox is conspicuously incurable. The catatonic symptoms can easily be conceived as purely repressive devices, and it has been definitely proved in some cases that certain stereotyped actions are distorted representations of the fulfilment of repressed wishes; but, at the

same time, we must not lose sight of the fact that these same symptoms also occur in certain organic cerebral diseases, whose origin is at least much more organic than psychical. Again, the question is not yet absolutely settled whether dementia præcox is a psychogenic or organic disease. Alzheimer and others have described areas of gliosis in the deepest layers of the cortex; others have discovered fatty degeneration of the nerve cells; others, again, have observed cerebellar changes, all of which might very well be due to excess or defect of certain internal secretions. This idea, surmised by Kraepelin, has been rendered probable by Mott's discovery that certain glands possessing internal secretions, especially the ovaries and testes, are more or less atrophied in dementia præcox. On the other hand, Jung appears to have cured, or at least considerably ameliorated, some cases of dementia paranoides by psycho-analysis only.

The chief characteristic of patients suffering from dementia præcox is that they are living a dream, and, in the end, completely retire from the world of reality (autism). Up to the present very little psychological investigation of the disease has been made; but we hope to learn much from the investigations now going on at Zurich. For the present, therefore, we must regard the pathology of dementia præcox as still undetermined. By various psychological means, especially by re-synthesis, attempts are made to reform the mental structure of these patients in the early stages; but hitherto the results have not been encouraging.

The last disease I submit for your consideration is Paranoia. This is a mental disorder of the fourth or fifth decade, as a rule, and it is characterised by the progressive development of systematised delusions. The patients, being of a suspicious temperament, see hidden meanings in incidents which possess no unusual value for the ordinary man, and from the inevitable accumulation of such misinterpretations they evolve a system of delusions which vary from patient to patient.

The cases are divided into two main classes:—

1. The eccentrics or mattoids, the borderland cases of insanity, including faddists and cranks of all kinds, anarchists, revolutionaries, Christian scientists, vegetarians, anti-vaccinationists and anti-all-sorts-of-other-things, and in general people who get a distorted view of life through attaching undue importance to minor incidents. (This class has not been submitted to modern psychological investigation.)

2. The egocentrics, including patients who suffer from delusions of persecution, jealousy, exaltation, and ill-health (hypochondriacs). To this class also belong patients who believe that some person of the opposite sex makes signs that they are in love with them, and also the patients who believe that they have some religious mission to perform.

All these patients are perfectly clear mentally, have no hallucinations, behave well, and can think intelligently apart from their particular delusions; but they are firmly convinced that there is nothing mentally wrong with them, and therefore always feel aggrieved when they are involuntarily placed under care for their malady.

Since the advent of our new psychiatry many patients of this class have been analysed by modern psychological methods all over the civilised world, and the outcome has been the remarkable discovery that paranoia is a psychosis erected on the invariable basis of repressed homosexuality. Naturally enough, the idea that a person has homosexual inclinations is usually repugnant to him; he refuses to admit it to himself, and it is repressed into the unconscious. Should such repression fail, the homosexual complex reappears in consciousness in the disguised form of paranoia, or, I may add, as dementia paranoides; for it has been shown that the same psychical mechanism is at work in this variety of dementia præcox—designated by Kraepelin in his most recent edition, by the way, as “paraphrenia.”

Freud himself has rendered one of these later cases classical by his analysis of it. Dr. David Paul Schreber, a lawyer who was sufficiently eminent to have become President of the Saxon Senate, was under observation from 1893 to 1902 for dementia paranoides. He was released as the result of a legal decision, in which the delusions are thus summarised: “He considers himself called to save the world, and to bring back the lost state of beatitude. This he could do only by changing himself from a man to a woman.” The following year Dr. Schreber published a clinical history of his own case, which Freud subsequently analysed with notable psychological insight, and showed that the patient was a repressed homosexual.

The researches in paranoia are particularly interesting in that they throw a certain amount of light on the mechanisms of unconscious reasoning. Unconsciously the paranoiac always starts with the premiss, “I love the man” (I am assuming the patient to be a male).

The arguments in the several varieties of paranoia then run as follows:—

Persecuted Paranoia: “I love the man”—an intolerable idea, therefore becoming “I do not love the man; I hate him.” This, by projection, becomes “He hates me”; “I am persecuted by him.”

Exalted Paranoia: “I love him”—again an intolerable idea, therefore “I do not love him; I love myself.” This, by projection, becomes “Everybody loves me”; “I am a great person.”

Religious Paranoia: “I love him,” being intolerable, becomes “I love Him” (spelt with a capital H), meaning “I love God.” This, by projection, becomes “God loves me”; “I am the chosen one of God.”

Amorous Paranoia: The intolerable “I love him” becomes “I do not love him; I love her.” This, by projection, becomes “She loves me.”

Jealous Paranoia: “I love him,” as usual, is replaced by “I do not love him; she loves him.”

The mechanism of hypochondriacal paranoia is similar to that of exalted paranoia, “I love myself” becoming “I must take care of myself”; and querulent paranoia is only a special variety of persecuted paranoia.

Although psycho-analysis has been successful in elucidating the psychology of this disease, the method usually fails as a mode of treatment. I understand, however, that some psycho-analysts have effected a cure, and many have alleviated the patient sufficiently to enable him to go about his business with a certain degree of mental comfort without molesting those people with whom he is brought into contact.

Recovery is said to have been effected in a few cases of fairly recent origin by a method which somewhat resembles psycho-analysis, but differs from it in that the physician seeks, in the first instance, to obtain a positive transference before tackling the disease itself. He gets the patient to give a complete history of his life, endeavouring meanwhile to discover incidents and characteristics which have a bearing on his delusional state and to disclose them. During the whole of this process, which takes twenty to thirty hours, he accepts the patient's point of view throughout until he ultimately gains his whole confidence and convinces him of his friendship; without, however, actually encouraging his delusions or agreeing with every word he says. Then, when a suitable opportunity offers, he suggests that the patient may have come to an erroneous conclusion about some quite insignificant occurrence.

After a few more sittings, as opportunity offers, he points out another minor occasion when the patient might have been mistaken. So he goes on until he sees his chance for tackling the main delusion, and pointing out that even here he may also be mistaken. The physician takes advantage of any attitude of doubt, and completes the cure by "therapeutic conversation." The whole procedure requires an enormous amount of tact, patience, and skill. Moreover, the physician must be familiar with these mechanisms of paranoia which have been discovered by the psycho-analytic method.

The main object of these lectures has been, however, to expound the principles of psycho-analysis proper, its technique, the psychological mechanisms which it has disclosed and the bearing of these mechanisms, not only on 70 per cent. of the 160,000 patients in the asylums of Great Britain, but also an enormous number of people pursuing their ordinary vocations in spite of curable mental worries or spending an enormous proportion of their time and income in nursing-homes. Physicians who will undertake the radical cure of these poor sufferers will earn the gratitude of society as well as that of the patients, which is always unbounded; but he must be a man of courage, for he will have to face the opposition of the "herd" for many years to come. In spite of all we may say, the subject of sex will remain taboo, yet no physician of experience can deny the enormous rôle played by sexual conflicts in the genesis of the neuroses. I do think that cases sometimes occur in which the psychogenetic conflict is non-sexual, but they are so rare that I can see the psycho-analytic literature of the future augmented by reports of such cases as curiosities.

Although I attach so much importance to psycho-analysis, I hope that no words of mine will detract from the systematic investigation of cases by other methods. It would be deplorable, for instance, if attention to psychological investigation should detract from the work of the clinical laboratory, and thus allow a positive Wassermann reaction—so common in dementia præcox, for example—to be overlooked.

It has often been said that the frequency of mental disease is due to the effect of civilisation: to the hurry, bustle, and struggle for existence associated with urban life; to defective sanitation, insufficient sleep, overwork, poverty, brain-fag, education, and a host of other things incident on civilisation. With all our modern conveniences—the poor law, hygienic surroundings, hospitals, comfortable railways with restaurant-cars and sleep-

ing accommodation, typewriters, and telephones—such a view is manifestly erroneous.

That insanity is the result of civilisation is obvious to anybody who looks the facts in the face; but psycho-analysis has revealed that the essential factor is not hurry, bustle, and brain-fag, but the repression of the instincts enforced by civilisation. Recognising this fact, we can now see the solution of a host of problems in other domains of mental disease. General paralysis, for example, has been ascribed to the effects of civilisation and syphilisation, because, although syphilis (an acknowledged factor in the causation of general paralysis) is rife in certain uncivilised communities, general paralysis is rare. The explanation is now forthcoming, for we recognise that the essential difference between civilised and uncivilised communities lies in the fact that the instincts are much more repressed in the latter. The recognition of this fact has a practical bearing on both the etiology and treatment of mental disorders.

Our personal impulses tell us to eat, drink, and be merry, and to gratify our predatory and sexual instinct; but the herd instinct tells us to be above all such animal passions.

Yet it is not to be supposed that the prophylaxis of insanity lies in letting loose the reins of licentiousness and depravity. The problem is far more intricate than this; and it is not likely that it will be solved in the present century, much less in our own time. The mystery at present surrounding sex and birth problems must be removed by systematic education of the young in such matters, early marriage must be made more possible than existing circumstances will permit, and old men and parents will have to remember the days of their own youth when they enact the laws which are to govern society. Moreover, the whole populace will have to be educated in such matters before any serious change can be accomplished.

JEAN ASTRUC AND HIS CONJECTURES.*

By EMERITUS PROFESSOR SIR ALEXANDER SIMPSON, M.D., D.Sc., LL.D.

“THIS work was composed some time since, but I hesitated to publish it, fearing that the self-styled free-thinkers who seek support on all sides might make an ill use of it for lessening the authority of the Pentateuch. A learned man, very zealous for religion, to whom I showed it, dispelled my scruples. He has

* Read before the History of Medicine Section of the Royal Society of Medicine on 17th February and partly reported in the Society's Proceedings.

assured me that what I supposed about the documents of which Moses had made use in composing Genesis had already been advanced in essence by several authors (such as the Abbés Fleury and Le François) in works well approved; that the special application I was making of the suggestion in distributing Genesis in several columns, representative of these documents, made no change whatever in the text of the Book of Genesis, or made no more change than what had been done in dividing it into chapters and verses; and that so far from being in any way prejudicial to religion, it could not fail, on the contrary, to be very helpful in serving to remove or clear up several difficulties which present themselves to the readers of the book, and under the weight of which commentators have been hitherto almost overwhelmed. On his advice, then, I have decided to publish this work and submit it to the judgment of the enlightened, whose observations I will be pleased to hear. I protest beforehand very sincerely that if those who have a right to criticise, and whose criticism I ought to respect, find my conjectures either false or dangerous, I am ready to abandon them; or, better, I abandon them now. Preference for my ideas will never prevail with me over the love of truth and of religion."

So runs the preface to a small (525 pp.) volume written in French and published in 1753, of which the Advocates, the University, the New College, and the Royal College of Physicians of Edinburgh have each a copy in their respective libraries. The title-page tells that it contains "*Conjectures sur les Mémoires originaux dont il paraît que Moïse s'est servi pour composer le livre de la Genèse. Avec des Remarques qui appuient ou qui éclaircissent ces Conjectures.*" It bears the motto:—

Avia Pieridum peragro loca, nullius ante
Trita solo.

The author's name is not given. But it was well known to have been written by a physician, Jean Astruc, as the four respective librarians have noted.

THE BOOK.

From the book one gathers that the author was an accomplished scholar, well versed in various languages and accustomed to read the Bible in the original. It does not occur to him to doubt that the Pentateuch came from the hand of Moses, and that it is all to be accepted as part of a Divine revelation. But he uses his imagination. He wonders how Moses knew all that he has set

down here. Moses' own memory could only go back to the things he treats of when he gets into Exodus. How did he know about the Creation, the Deluge, and the rest of the Genesis record? Either he must have been taught by special revelation, or he learned them from those who could tell the stories. Astruc does not know of any who hold by the first of these alternatives. Moses, though in other parts of the Pentateuch he claims, like later prophets, direct Divine authority for his messages, speaks throughout Genesis simply as a historian. It must be supposed, therefore, that he derives the events he records from ancestors who during the 2369 years of the Usserian reckoning had successively witnessed them and passed on the narratives to their descendants. "All the same," says Astruc, "it must also be admitted that Moses was enlightened in a special way and by inspiration in his choice of the facts and attendant circumstances he had received from his forefathers; and that we owe to the history he has bequeathed to us the foundation of the Divine Faith."

The suggestion is discussed that the stories have come down through "Shem who had seen Lamech, who had seen Adam, and who had himself been seen at least by Abraham, who had seen Jacob, who had seen those who might have told Moses." But he sets it aside in favour of the idea, already entertained by Le Clerc, Simon, and others, that the Hebrew race were in possession of a series of written memoranda dealing with their origin and history. These Moses collected, and may be supposed to have kept them in portions according to the incidents related, each in its entirety, so that nothing should be lost. Hence repetitions, with variations of the same story; hence some anachronisms as to the order of events; hence the predominant use in one passage of Elohim, the common name of God, and in others of Jehovah, "God's great name, the name which expresses his essence." The Jews shrank from pronouncing this name and read Adonai instead, and put the vowel points of Adonai under the consonant of the sacred name. If Genesis be decomposed according to the prevalence of these names into distinct sections, placing those with Elohim in a column A, and those with Jehovah in a column B, the differences in the documents become clearer. Then it might be necessary to have a column C for a few facts recorded thrice, and a fourth column, D, for passages outside the proper Hebrew history and where no name of God is employed. There may be further subdivisions and arrangements of columns, going as far as L or M. But Astruc

thought the construction of the book would be sufficiently indicated by the use of the A, B, D columns, which he accordingly proceeded to arrange with the gaps in successive chapters in one column filled up by the verses to be found in the corresponding chapter of the neighbouring column. It would not have been intelligible to many if printed in Hebrew. The Septuagint and Vulgate versions, and translations from these, have not always rendered the names definitely enough. The Geneva version, a direct translation from the Hebrew, gives consistently the general name for God as its rendering of Elohim, while for the essential name it adopts the sufficiently expressive rendering The Eternal. So he reproduces the Geneva version of Genesis in this columnar form; and afterwards goes on to show how such a view of the book clears away the various difficulties which have been a burden to commentators and weapons of attack for opponents of the faith. He wishes his readers not to make up their minds on a first reading. "When we have to undo a prejudice in which we have been brought up, we must accustom ourselves gradually to the opposite opinion and give time for the reasons for embracing it to act upon us, for preoccupation (*prevention*) never yields but with difficulty, and counterbalances for long the strongest proofs." It is all done on the intellectual plane, reverently towards its subject, respectfully towards the reader.

THE MAN.

What manner of man was Jean Astruc? I first met him in his latest work—*L'Art d'Accoucher réduit à ses Principes*, published in 1766, the year in which he died. Here he styles himself "*Professeur Royal du Médecine, et Médecin Consultant du Roi.*" He was a man, then, in the highest rank of his own profession. Of a well-connected family, he was born in 1684 at Sauve, in Languedoc, in a Huguenot manse, and baptised in a Protestant church. But he never knew himself as other than a professed Roman Catholic. Whilst he was but a child his father abjured his Protestant faith, took to the profession of law, and devoted himself to the education in literature and philosophy of his two sons, who never had any other teacher. The younger of the two died at a comparatively early age after a brilliant career as an orator and professor of French law in the Faculty of Toulouse. Jean studied medicine at Montpellier, where he "sacrificed to the pleasure of study and observation all the amusements of his age, and even the pardonable delights of society"; published his first

dissertation while only a Bachelor of Medicine in 1702; obtained the same year the licence in medicine, and in 1703 the M.D. degree. In 1710 he won by competition the Chair of Anatomy and Medicine at Toulouse. In 1717 he filled a Chair in Montpellier. The King of Poland called him to be his physician in 1729; but the following year he went to Paris, where libraries were accessible to him for the prosecution of his labours. Almost immediately he was honoured with the title of Consulting Physician to the King, and in 1731 was appointed to a Chair of Medicine in the Royal College. His lectures were marked by such graces of style that many people who had no interest in medicine attended them as models of beautiful Latinity. He was a ceaseless worker. "He might be seen in the coldest winter night at an advanced age studying at three in the morning without a fire by the light of a lamp." The Faculty of Medicine honoured him in 1743 by co-opting him unanimously as one of its members. "This unanimous vote of enlightened men, more precious to a man of science than all the favours which fortune sometimes flings indifferently to merit or to ignorance," Astruc much appreciated. He took a constant interest in the work of the Faculty, and "visited the poor patients who came for advice on Saturdays as diligently as if he had nothing else to do." So he kept on working in old age; and though his infirmities were aggravated by his great grief at the death of his only daughter the year before his own decease, he took an active share in the researches of a commission appointed by the Faculty to report on inoculation, and died in 1766, at the age of 82.

AS HE APPEARS IN HIS WORKS.

This and much more is recorded of him in a biographical sketch prefixed to a posthumous volume of *Mémoires pour servir à l'Histoire de la Faculté de Médecine de Montpellier*, edited by his friend Dr. M. Lorry, who explains that the infirmities of advancing years led to his publishing some of the works, such as the *Conjectures*, for which he had long been collecting material. In the preface to his *Histoire Naturelle de Languedoc* Astruc says he hesitated long about the publication, "because it seemed to me that it was not becoming in a person engaged in a very serious and very exacting profession to take himself up with researches in pure physics or literature. But at last love of country has carried me past this scruple, and I have let myself be persuaded that my present occupations do not prohibit the publication of

a work composed long ago." This work has three divisions—geographical, physical, and literary. It is full of conjectures, as, *e.g.*, in regard to the positions of places in old itineraries, and his knowledge of Hebrew enables him to correct mistaken conclusions that have been drawn from the itinerary of Benjamin of Tudela.

The preface to his *Midwifery Manual** begins by explaining that he had never attended a case of labour! But having undertaken, at the urgent desire of the Faculty of Medicine, to deliver in 1745 a course of lectures to midwives, and being given six months in which to prepare, he set himself "to read or re-read all the treatises on the art which had appeared in French or Latin within the previous thirty years." The course was a success. It was continued two years more with "new lectures, new extracts, new reflections." He had laid aside these Lectures on Midwifery until it was represented to him that although the midwives in Paris and some other large towns received instruction, throughout the provinces generally they were untaught, and might profit by the reading of his lectures. Still, he did not make up his mind till it occurred to him that it was the necessary complement to a more important treatise† he published on the *Diseases of Women*. Needless to say, neither treatise is of value nowadays, either from a scientific or a practical point of view. But Astruc had a keen delight in laborious historical research, and he devoted sixty pages to a history of the Obstetric Art. About thirty years ago, at the instance of Principal Sir Alexander Grant, I drew up a *History of the Edinburgh Chair of Midwifery*, which proved to be the first to have been instituted in any university. Inquiring into the causes and date of the transference of obstetric practice from women to men I had to quote Astruc as the recognised authority for the explanation that it was all a matter of fashion, resulting from the secret and successful management by a surgeon, at the instance of Louis XIV., of the delivery of Madame de la Vallière, after which the princesses all wished to be attended by surgeons, for whom the designation was coined and adopted into other languages of accoucheurs. Having referred to his eminent position as a medical authority, I added that, "by pointing out the distinction

* "Je multiplierai vos douleurs et vos grossesses; vous mettez au monde vos enfants dans la douleur. Genèse III. 16" is printed on the back of the title-page.

† In the preface he has a sentence "against blindly following our own imaginations and substituting conjectures, hypotheses, and mere suppositions for truths."

between the Elohist and Jehovistic passages in the Old Testament, he opened up a path for theologians along which the higher critics of our day have travelled to a length that would greatly have astonished him."

My justification for that remark rests on the acquaintance I had made many years earlier with an appendix to this same *Manual*, called on the title-page *Une lettre sur la conduite qu' Adam et Eve dûrent tenir à la naissance de leurs premiers enfants*. I was working at a dissertation for the Royal Medical Society on the umbilical cord and its torsions, which I afterwards presented as my thesis for graduation, with the motto—

Deus æthere missus ab alto
 tortos incidere funes
 Ecce iterum stimulat,

and among other readings came upon Astruc's letter. I had no occasion to make use of it, though it may have suggested the motto. But the memory of its quaint conceits and the naïve suggestion that God Himself came down to give Adam and Eve the first lesson in midwifery remained with me. It has this interest that it is the last output of all Astruc's activity.

The letter, eighteen pages in length, was occasioned by the quandary into which his friend, Mr. F. D. B., was thrown by a "philosopher* of the time," who propounded to him a puzzle as to how Adam and Eve comported themselves on the birth of their first children. "Did they tie and cut the umbilical cord as we now do? How did they know what to do? Who taught them? They had been created without an umbilicus and had never seen a child born. Did they not tie and cut,† then the children must all have died, and there was an end of the race?" "You tell me, Sir," writes Astruc, "that this objector has embarrassed you, and you beg me to show you how to reply. But you seem to me to be greatly shocked with the air of complacency and the tone of mockery with which it has been proposed to you. Don't you know that that is the way with these gentry? Full of the sublimity of their lights they think that the least difficulty they bring forward ought to upset truths the most worthy of respect. But they do not long enjoy this

* A French variety of the species, of which Addison sketches a specimen (*Spectator*, 5th September 1712, who sets up for a free-thinker and is an atheist as much as his parts will give him leave. Mr. B. invites Astruc to answer his philosopher as Will Dry was called on to shut up Tom Puzzle.

† He has noted elsewhere that by the Greeks the practitioners of midwifery were called *ὀμφαλοτόμοι*.

vain triumph. Answer them and they are confounded. It is the case of him of whom Horace says:—

Qui fragili querens illidere dentem,
Offendit solido.

“This is exactly the case of your philosopher. Nothing more frivolous than his objection. I send you three or four answers, that he may have his choice of them. They are all plausible. I might say they are all solid.”

1. Adam must have been greatly surprised to see the after-birth attached to Cain by the cord, but he let it alone, till in five or six days it fell off. He profited by the observation, and when Abel was born he cut the cord. Seeing some blood escape he tied it, and so from the birth of the second child the deligation and division of the umbilical cord began to be practised, by which the human race was saved.

2. Adam while still in Paradise had given names to all the creatures, and must have observed how some of them gnawed the umbilical cord of their young at birth without loss of blood. When his wife, expelled with him from the earthly paradise, began to give birth to children, he may have cut through the cord with his teeth, as savages used to do when the French first landed in Brazil. If any bleeding followed he would naturally tie.

3. I go even further, and I suppose that Adam, disliking the sight of placenta and cord hanging from Cain, pulls them off. What then? “Certain death to Cain,” says your philosopher. Not at all. Through a series of pages of reasoning and citation of authorities Astruc shows that such an accident is not necessarily fatal, and concludes that Adam may so have treated Cain without harm and without the loss of the human race.

D. F. B. might give the philosopher his choice of any of these solutions of his difficulty. “They are all plausible and conclusive. For myself, Sir, I do not adopt any of them, but I believe you can answer your philosopher in a manner more general and decisive.”

4. I believe that God who taught the birds to build their nests, and the quadrupeds how to deal with their young, taught Adam what to do to save his children at birth. “It is certain that He deigned to give instruction to men at the beginning of the world in matters of much less importance.” He had taught Adam whilst still in the earthly paradise to speak, so as to be able to name the animals; He taught Cain how to till the ground and Tubalcain how to work in metals. “Why should we not say;” he repeats, “that God had taught Adam what was needful to be

done for the preservation of his new-born children, supposing He had left anything to his care."

5. Astruc would have his correspondent round upon his assailant. "These gentry think themselves quite strong in their attacks; they are quite weak when they are put on the defensive." Either the race began by the creative will of God, or it exists of necessity and from all eternity. If the philosopher admits the first alternative, he only differs from the Church in giving an earlier date to the origin of the race, and his difficulty remains. To adopt the other alternative is to admit the palpable absurdity of a *necessary series of contingent individuals*, which is a manifest contradiction. Either the men of this series have learnt by repeated observations the necessity of tying the cord, and, in that case, before they had acquired the knowledge the race would have had time to perish, or this knowledge was in them necessary and innate. Thus you have a new absurdity, which need not surprise us, for absurdities evoke one another. Admit for the first man of the created series the same knowledge as innate but not necessary, for it was given by God. So the assailant is foiled with his own weapons, despoiled of their impiety.

"Show this letter, Sir, to your philosopher. If he is willing to read it with care, I hope it will shake the confidence he has in his opinions. But I desire that my reflections may have a yet happier success, and that they may guide him to fair reason, and persuade him to have more respect for the truths of revelation." This, I note again, is the last expression we have of Astruc's active mind.

If we look back into some of his other writings we get just such an impression of the man as arises from an unprejudiced reading of the preface to his *Conjectures*. His greatest and best known work is that on *Venerical Diseases*, written at first in Latin. It has been a mine of information for syphilologists interested in historical research. As regards the origin of this disease, he strongly advocates the opinion that it was of recent development. Quoting in his preface from Lucretius—

Medio de fonte Leporum
Surgat amari aliquid,

he says, "In the midst of sensual pleasure there arises something bitter, nay, very bitter, which plague, neither seen nor heard of in ancient times, seems lately to have escaped out of Pandora's box, as a bitter dreg reserved for this wicked age, either by way

of bridle to restrain our ungoverned lust or of a whip to punish it." In one of his notes he hopes he will never come under the censure of Scribonius Largus, "who, although he was a heathen, expressed himself so much in the manner of a Christian that he may rise up in judgment with not a few of the Christians and condemn them. Such (says he) 'as discover the usefulness of certain remedies and keep it a secret are very much to be blamed, being guilty of the crime of envy, which ought to be hated by all mankind, but especially by physicians, who, if they do not abound with that compassion and humanity which ought always to attend the profession, deserve to be detested both by gods and men.'"

In Book I, Chap. IV., he declares that "It is much against my inclination to bring in the sacred scriptures into a subject of this kind, but I am forced to it by those who contend for the antiquity of the venereal disease, who omit nothing that can be thought of in order to support their opinion, while they hope to cull anything out of them in favour of their subject. But they only expose their ignorance by affecting too much knowledge, and show more learning than judgment in quoting those very passages which, if examined with sufficient diligence and accuracy, are plainly rather against them than otherwise." Then follow discussions through a series of paragraphs in his orderly fashion on (1) leprosy; (2) some references in the Mosaic laws; (3) Job's boils, which they interpret to Job's discredit, and which Astruc takes to be of the nature of elephantiasis; and (4) "they are at a great deal of pains, and labour very assiduously, to asperse David with that scandal of which we have cleared Job." Astruc agrees with the majority of commentators that the Psalmist's complaint "ought to be understood, not of bodily sickness, but of the mind diseased by sin . . . ought not to be taken in a literal sense, as relating to complaints of an infirm and sickly body, but to the tortures of a grieved and penitent mind." In his history of Montpellier he has occasion to speak of Rabelais, and censures his "impious allusions to the words of the sacred books and profanation of what is most to be respected in religion."

PROFESSIONAL ESTIMATES.

We may gather the impression made by Astruc on his medical brethren from the eight columns (the conjoint work of Chaussier and Adelon) that are devoted to him in the *Biographie Universelle Ancienne et Moderne*, 1811. Referring to his having been trained

at Montpellier, where the misleading mechanical system of Boerhaave had displaced the chemical theories of Sylvius, etc., the writers say, "Astruc, whom Nature had endowed with a mind upright (*esprit droit*) but not active enough to preconceive of himself any high truth, followed the false direction, and in all the course of his long and laborious career, if he showed himself profound and able in the science of books, he was backward in the rigorous way of observation and research—in a word, his speculative and practical medicine in place of being Hippocratic and vital was entirely mechanical and mathematical. However, few men won so great a reputation among his contemporaries. Astruc, as regards theory, owed his success to his natural eloquence and to a spirit of method, which, setting him to divide the subject he sought to develop, made him move from one division of his theme to the other by rigorous definitions. This made him a fascinating professor, whilst his zeal for study and his prodigious memory made him an erudite man. As regards practice, his reputation was due to a spirit of reserve and circumspection, which usually led the medical practitioner to a wise expectancy, by which he replaces the precious but rare quality of medical tact. Astruc had not in theory any of the large views which go to the deep foundations of a philosophy of medicine, nor, in practice, the rapid and sure perception which judges at once and without the risk of the least error the movements of Nature in diseases. This in fact is not to be found in any of his numerous writings."

The same biographers speak of him again as "endowed with a prodigious memory, an upright mind, but cold and not very original, capable rather of receiving an impulse than given to publish it," but that he established "order in his vast works of erudition." He engaged in various medical controversies, among others on the nature of digestion with Professor Pitcairn of Edinburgh as to whether it was more a physical (Pitcairn) or a chemical (Astruc) process. Each went wrong in his negations. Referring to this contention, in which I have to confess that my countryman wrote of Astruc in very unparliamentary language, they remark, "His writings may at least be cited as a model of courtesy in controversies." As to the treatise that specially interests theologians, they say, "We have said that metaphysics was one of his favourite occupations. In 1753 it inspired him to write his *Conjectures*; and soon thereafter, to dispel the doubts that his work had raised regarding his orthodoxy, he published

two dissertations on *Immortality* and on the *Immateriality and Liberty of the Soul*." The *Nouvelle Biographie Générale*, 1854, says of Astruc, "Love of work and desire to increase the domain of science prevailed above all other sentiment in him. He won without seeking them honour and fortune, and sacrificed everything to the taste that dominated him."

ANOTHER ESTIMATE.

It is but fair to try and present Astruc as he has appeared to the members of his own profession, because there is now in another sphere of literature a portrait which it is hard to recognise as a likeness of the same man. Whilst his medical writings have no longer anything but an antiquarian interest, his *Conjectures* have been revived at the desks of theologians. As Miss Julia Wedgwood puts it (note, p. 73) in her *History of Israel*, "This book is generally considered the foundation of Old Testament criticism." She adds, "He wrote also a long series of medical books, which, in so far as they brought him a scientific standard of accuracy, must be considered a valuable preparation for that by which he is remembered." So also Principal Skinner in his recent work on *The Divine Names in Genesis* attributes to Astruc the discovery which "first furnished a positive clue to the separation of documents in Genesis" (p. 7); and maintains that after the lapse of a century and a half "criticism, still following the guidance of the divine names of the M. T., finds no occasion to distrust it, but, on the contrary, discovers that it is frequently confirmed by independent considerations" (p. 183).

Now the literary superstructure that has been reared on the Astrucian foundation, while it passes for some as a Temple of Truth, with an Aaronic race of priests serving at its altars and a Mosaic succession of prophets speaking at its gates, is looked on by others as a College of Errors, with men of the kindred of Annas and Caiaphas, and John and Alexander,* filling too many of its chairs.

The late Dr. Howard Osgood of Rochester, New York, was one of the earnest and able Bible students opposed to the conjecturings of the higher criticism. He, being engaged in searching into the history of the Huguenots of France, came amongst the records of these brave witnesses for the truth on several who bore the same

* Who compassed the death of the Messiah and afterwards "were grieved that unlearned men taught the people and preached through Jesus the resurrection from the dead."

name as the author of the *Conjectures*. This led him to inquire more closely into the career and character of Jean. The result is given in a slashing paper in *The Presbyterian and Reformed Review* (1892, vol. iii. p. 83, Philadelphia). It is a pitiful story, gathered with much care and with a copious bibliography out of the scandalous annals of the French Court in the middle of the eighteenth century. Dr. Astruc, for whom the one apology offered or suggested is that his practice lay largely in a direction "that brought him into relation with depraved patients," is stripped of every rag of virtue and made to stand forth in his old age as the intimate associate of the wickedest people in the wicked entourage of Louis XV., and as an active accomplice in their most nefarious transactions. Godless, without natural affection, adulterer, cheat, thief, liar, the covetous old miser has just stings of conscience enough left from his Huguenot heredity to want to blunt their sharpness by an effort to destroy the authority of the Bible with its condemning decalogue. And when he was encouraged to publish his *Conjectures* by the advice of a Roman Catholic prelate a degree more wicked than himself, he was ashamed or afraid to put his name on the title-page, and falsely gave it out as a Belgian publication.

I read the article a few years ago when I was interested in the election to a Chair of Hebrew, and was staggered. Dr. Osgood's presentation of facts seems incontestable. Only I inwardly demurred at the time to his conjecture as to the motive that prompted Astruc in making his Genesis conjectures, and I made some notes of the things I write now. For I thought, and think, that the Astrucian *Conjectures* are the sheer outcome of a mind long used to take delight in critical inquiries and historical research, that they were for him an intellectual pastime such as crops up in his properly professional writings, and in the pursuit of which his active brain found rest when it turned aside at times to other than medical disquisitions. I laid the notes aside—in old Astrucian fashion, shall I say?—till my friend Dr. A. C. Dixon of the Metropolitan Tabernacle sent me *The Higher Criticism of the Pentateuch* by Professor Green of Princeton. There, referring to the first attempt to decompose Genesis into the prior documents supposed to have been embedded in it, it is curtly said to have been made by "Astruc, a French physician of considerable learning, but of profligate life." Well, let the man have been as bad as Dr. Osgood saw him to be, yet let that last sentence that we have from his own pen be counted to him for righteousness. And may we not remember that it was a bad man, for whose wickedness

no apology is offered, who said in his political wisdom, "It is expedient for us that one man should die for the people and that the whole nation perish not?" And the word of the Cross of which Caiaphas was moved to prophesy became that with which the heralds of Christ turned the world upside down. If there are errors in the findings of scholarship, let them be met by the truer findings of a better scholarship. Scholars on one side or the other cannot make profit for their argument from immoralities they may have detected in opponents' lives.

THE SCRIPTURE CANNOT BE BROKEN.

"Give me Scripture!" said Professor John Duncan to a friend of mine fifty years ago when they were discussing the subject of the Parousia—"give me Scripture, Sir, and you *command* me." The authority of the Bible from Genesis to Revelation has lost nothing of its commanding power to the Christian heart, while Dr. A. B. Davidson, the devout and scholarly successor of the venerable "Rabbi," with his like-minded and gifted pupils have been teaching us to wait with prayerful expectation for the outcome of reverent historical research into the sundry times and divers manners in which God spoke of old time to the fathers by the prophets. If it be permissible to use haltingly the personal pronoun, I find myself in learning the lessons of life put to two schools: Science is mistress of one. Grace reigns in the other. The school of science is the school of the privileged, who can afford to matrieculate. Her text-books are *many*; and they change from century to century, often very rapidly, for they deal with the knowledge that vanishes and shall vanish away. Grace holds her door open to whosoever will. The legend over our Edinburgh Royal Infirmary entrance reads like her's—*Patet Omnibus*. Bringing salvation to all men, she comes with her *one* inspired and inspiring Book, teaching her lessons to every man in his own tongue wherein he was born.

The science of to-day bids me read the history of my physical pedigree beyond primeval man through imagination-battling ages to the simple cell from which all living creatures might be evolved, and lets me see in my own embryogeny transitory traces that point to recapitulation of the æonic evolution. Her methods come short where mind and heart cry out for the Evolver. Here grace becomes the guide to where in the beginning God wrought; and for my spiritual ancestry she takes me to an earthly paradise where the Creator began to have fellowship with a creature made

in His own image. There she bids me hearken to man's first words to his Maker after his fall from innocence—"I heard thy voice . . . and *I was afraid* . . . and hid myself." She takes her convicted pupil by the hand—for his goings need holding up—and through story and song and wise sayings and prophecies of the men in the times of the Old Covenant, and through more directly regenerating gospel and treatise and epistle and apocalypse in the New, she leads him on—the outward man perishing while the inward is renewed day by day—till, ere she lets him read the Benediction colophon, she sets him full in view of a heavenly paradise beside a brother and companion, who, when he hears the voice from Heaven say, "Surely I come quickly," responds with *love that has cast out fear*, "Amen, Even so, come, Lord Jesus."

The two schools are not contradictory, but complementary. The graduate in one who wills to be agnostic of the teachings in the other puts an arrest on his proper evolution; he wills not to grow to be the man he was meant to be.

I am not to be Jean Astruc's judge.

REPORTS OF SOCIETIES.

Edinburgh Medico-Chirurgical Society.

A MEETING was held on 5th May 1915, Dr. John Playfair, President, in the chair.

Mr. Jardine (for Professor Caird) showed a case of *excision of the larynx*.

Dr. Dawson Turner showed a man after *treatment by radium for a large sarcoma of the anterior chest wall*. Several tubes of radium had been implanted into the tumour, which had completely disappeared. Professor Denys of Louvain gave an address on *Tuberculin Therapy*, which will appear in the *Journal*.

The President congratulated Professor Denys on his admirable paper and on the excellence of his English.

Sir Robert Philip endorsed what the President had said. Professor Denys had been driven from his home and laboratory. He was not only a splendid representative of a country without whose services this nation might probably not have been in such comfortable circumstances, but he was also one of the greatest representatives of the highest and best in modern serology. There was no doubt that much of the pioneer work that was often accredited elsewhere really belonged to Denys. Professor Denys had given a sane, definite, and simple statement of his position. His results were more definite than the statements sometimes made, and all might not agree with them. But some of the critics of tuberculin therapy were apt to forget the nature of tuberculosis. The onset was slow. The resistance of the individual varied immensely. He was glad to learn that the best tuberculins were not made in Germany, but he noted that a tuberculin which he had found of service, that of Béranek, had

not been found useless by Professor Denys. The expectancy, even the desire, to see striking results had been the curse of tuberculin therapy. The argument that because no reaction occurred nothing had occurred was absolutely fallacious. What was required was a dose which would perturb and not disturb the patient. This required much fine clinical observation. Much disappointment was due to impatience. After tuberculin had been tried for a couple of months it was given up and something else tried.

When a tuberculous lesion became stationary the patient was not cured. Fibrosis might be established but the lesion might still be there, though latent, and therefore treatment must be repeated from time to time. Professor Denys had got good results by these means, and his clinical work had been prefaced by a scientific explanation of his plan. He hoped the surgeon would not be disappointed when he was told that in many cases his services would not be required. While he would always be required in certain cases, he would be well advised if he availed himself of the conservative and limiting effect of tuberculin. His sphere would be better defined, and his results at least not less successful.

Mr. Stiles welcomed Professor Denys particularly because of his hearty sympathy with him in political and military affairs. The confusion as regards tuberculosis almost equalled the present military confusion. As regards pulmonary tuberculosis and its complications, he agreed with Professor Denys and Sir Robert Philip. He did not profess to treat these, but if he could treat them by cutting he would do so, and say away with tuberculin. The cause of the confusion was fundamental and scientific. Ninety per cent. of the surgical tuberculosis which he saw was not human tuberculosis but a local lesion due to bovine tuberculosis—a totally different disease. Von Pirquet had told him that in Vienna there was little or no bovine tuberculosis, and that there it was not the custom to drink raw milk. The tuberculosis of the Continent and the gland and bone tuberculosis of Edinburgh were two different conditions. Many of the children he saw were strong and robust. They had a local lesion in bones or glands, and only 10 per cent. of them had pulmonary lesions. Sir Robert Philip had advocated that patients should be perturbed but not disturbed. Was he to perturb these patients with surgical tuberculosis for two years or more, or was he to disturb them for a fortnight and cure them?

In a case of advanced tuberculosis of the knee-joint it was possible to treat it with fresh air and tuberculin, and at the end of two years there might be cure with an ankylosed joint. The surgeon could guarantee cure with a stiff joint in six months.

In a gland case was the patient to be perturbed for a year or more by tuberculin, with the usual results of caseation, abscesses, and dressings, or was he to be disturbed by the surgeon for a fortnight and cured? Ninety per cent. of these cases were due to milk infection squeezed in through the tonsils.

Professor Gulland congratulated Professor Denys. He had seldom heard such a large mass of statistics so clearly and convincingly dealt with. He agreed with Mr. Stiles that many gland cases were best dealt with by the surgeon. But the surgeon was quite pleased when his patient was discharged with a good result at the time. The physician, however, saw many of these cases 4, 5, or 10 years later with further infection. Many of the cervical gland cases also had mediastinal infection. The success of post-operation treatment by tuberculin encouraged the use of it from the beginning. Bone tuberculosis was often successfully treated by tuberculin. He agreed with

everything that Professor Denys had said in regard to pulmonary tuberculosis. He did not think the kind of tuberculin mattered so much as the physician's experience of the one he used. He thought the doses should be small. There could be no general rule as to dosage or intervals. Each case had to be treated on its merits.

RECENT ADVANCES IN MEDICAL SCIENCE.

NEUROLOGY.

UNDER THE CHARGE OF

EDWIN BRAMWELL, M.B.

POST-LITIGATION RESULTS IN CASES OF FUNCTIONAL NERVOUS DISEASE FOLLOWING UPON TRAUMA.

THE application of recent legislation dealing with compensation in relation to injury is, without doubt, directly responsible for retarding recovery in many cases of functional nervous disease following upon trauma. All physicians will, indeed, agree that recovery is often indefinitely delayed by the award of weekly compensation, which provides a pittance upon which the patient is able to exist and consequently, at the same time, diminishes that incentive to effort which is a factor of such essential moment in the cure of these cases. Again, it will be admitted by all who have had experience of traumatic neurasthenia and hysteria, that the treatment of these affections is most unsatisfactory when litigation is pending, but that when once the question of compensation is definitely and finally settled, recovery is not only the rule but in many cases is often rapid.

There are several factors which tend to delay recovery in minor cases of traumatic neurasthenia and hysteria in which the patient is in receipt of regular compensation. One of the most important of these is the fear in the patient's mind that if he once commences work his compensation will be reduced, and that if by chance he should prove unfit and break down, the compensation he receives will be insufficient for the support of himself and his family. The medical attendant, wishing naturally to do all he can for his patient, not realising perhaps the importance of a decided opinion, and, it may be, fearing the responsibility which will fall on his shoulders should he take up a strong attitude on this question, sometimes unwittingly accentuates this state of doubt by expressing himself hesitatingly to the effect that the patient should *try* some light work to see what he can do, instead of encouraging the patient and urging him to effort, while indicating to him at the same time the importance of this in his own interests. The lawyer, too, is often responsible for delay in recovery by advising

the patient to continue to accept a weekly compensation, or to hold out for a slump sum which is often altogether excessive. The position of the neurologist for these reasons is often an aggravating one, for among the cases he sees are many which he is convinced from his experience would rapidly recover if litigation was definitely settled, and in which the beneficial effect of any assurances of this kind which he may express to the patient are apt to be thwarted by the, it may be well intentioned but unfortunately conflicting, attitude of the lawyer.

A number of the leading American neurologists took part at a recent meeting of the American Neurological Association in a discussion upon post-litigation results in cases of so-called traumatic neurasthenia, traumatic neurosis, and traumatic hysteria.

Dr. Dereum, who introduced the discussion, based his remarks upon deductions drawn from 605 traumatic litigation cases which he had personally examined. He expressed the view that hysteria always pre-existed in the individual, that the symptoms proceeded until final settlement, when they subsided and disappeared. Rest treatment was not to his knowledge subsequently carried out in a single instance. In over twenty cases the symptoms were so severe that the patients had to be carried into Court, either on stretchers or chairs, or were too severely injured to be brought into Court, and yet in all the symptoms rapidly disappeared after settlement. The speaker expressed his opinion that the law should assure compensation for physical injuries only, that hysteria was not evoked by physical trauma, but by fright and subsequent preparation for litigation, and that if no damages were allowed for fright, damages for hysteria should also, and logically, be excluded.

Dr. Patrick described the case of a woman in an hysterical fit whom he had seen at Salpêtrière. The physician in charge remarked that whereas in the old days these patients were submitted to frequent examination and demonstration, and continued to take fits regularly for years, the custom was now to leave them severely alone, when they were discharged in a few weeks. He suggested that the Association should express publicly to lawyers, legislators, and the laity at large, that the employers' liability laws, although they may be legal and sociologically expedient and even just, will add to the invalid list enormously, continuously, and increasingly. Dr. M'Carthy believed that everyone who was dealing with neuroses would necessarily, after years of litigation, find persistent symptoms, but was in agreement with Dr. Dereum's main conclusions. Dr. Adolf Meyer took up the view that it is utterly unfair to say that compensation should be awarded for physical injuries only; he thought it was urgent that a strenuous effort should be made to eliminate protracted litigation. Dr. Knapp thought that Dr. Dereum's position in the matter was extreme; there were certainly cases which never made complete

recovery, and in his experience the startling recovery as soon as damages were paid was distinctly rare. He believed that the suggestion brought forward by Dr. Dereum was an absolutely unjust proceeding. Dr. Pearce Bailey was of opinion that in his part of the country hysteria was rapidly diminishing. Injured people were now interviewed by very expert physicians and adjustors immediately after the accident, and if no period elapses for the working up of revengeful feelings the traumatic neurosis will rarely develop. In his experience functional capacity for work has usually only been regained after a good many months, in some cases after two or three years. Dr. Diller, speaking of a hundred cases which he had examined, agreed in the main with Dr. Dereum's conclusions, although he felt that this speaker's position was too extreme. Little or no improvement occurred before claims were settled. In many cases, indeed, treatment during pending legislation is harmful, for not only does the patient not improve, but he refers his lack of progress to his disease and not to his physician, with the result that the mental impression that his disease is severe and permanent becomes still more firmly fixed if he is treated by a skilled physician. A patient seldom presents himself for treatment after his claim has been settled, the improvement in these cases being usually gradual. He had met with several instances in which symptoms were quite marked one, two, or three years after claim had been settled. Although in nearly all the cases he had examined the patient exaggerated his symptoms, and sometimes grossly, he had not recognised a single clear case of malingering. While admitting that in many cases the subject of traumatic neurosis had been predisposed to by a neurotic temperament, the speaker held that these cases were entitled to damages, although they should not be excessive, for, if it had not been for the accident, the individual might have gone through life without showing marked nervous symptoms. Dr. Dereum in his reply, while admitting that he expected to find differences of opinion, held that the facts as to the outcome of litigation after settlement are such that they cannot be disputed.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

THE FUTILITY OF ARTERIOVENOUS ANASTOMOSIS IN THE TREATMENT OF IMPENDING GANGRENE OF THE LOWER EXTREMITY.

STETTEN of New York (*Surg. Gyn. and Obstet.*, April 1915) enters a very vigorous protest against the claims set up for the operation of arteriovenous anastomosis in threatened gangrene of the lower

extremity, an operation which he advises "should be entirely eliminated from our surgical répertoire." His indictment is based upon certain general anatomical and physiological considerations, a series of experiments he has himself carried out, and a critical analysis of the published cases. How thoroughly he has investigated the literature of the subject is evidenced by the bibliography appended to the paper, which includes no fewer than 164 references.

The author quotes various writers who have shown that the valves of the veins cannot be forced by the arterial pressure, and that obliteration of the anastomosis invariably follows the union of the vessels after a certain length of time. He protests against the use of the term "reversal of the circulation," as he has proved that no capillary circulation is established after the operation, which at best only effects a short-circuiting. His own experiments were carried out on lower extremities freshly amputated for gangrene due to arteriosclerosis or other arterial disease. After washing out the vessels with saline solution through the artery, an opaque solution was forced by means of a hand-pump into the vein, and an X-ray photograph was taken. In some of the experiments the artery was then injected in the same way and a second radiogram taken to compare with the first, and incidentally to study the arterial circulation in these cases of gangrene due to arteriosclerosis or other arterial obstruction. In all, 18 such experiments were performed. With one exception, which remains unexplained, no flow to any extent took place through the vein towards the periphery, and there was no evidence of capillary circulation after venous injection. The valves are apparently the cause of the obstruction (Wiewiorski has independently come to the same conclusion).

When the injection was made into the artery the startling fact was elicited that no matter how extensive the gangrene or how diseased the artery "there is a relatively perfect arterial circulation down to the minutest capillary in those portions of the limb that are not already gangrenous." The author anticipates the criticism that these experiments are not analogous to the conditions created by an arteriovenous anastomosis in life, but he claims that his observations prove, at least, "that in that type of condition where arteriovenous anastomosis might be indicated, . . . the flow through the pathological arterial system is immeasurably better and easier than it could possibly be through the relatively healthy venous system, no matter how extreme the arterial disease may be."

Summarising his experiments he says :—

"1. A peripheral flow through the patent veins in cases of gangrene due to vascular disease is only possible to a very slight extent. The valves are eventually an impassable barrier, even when

the injection is made with extreme force.* There is never any capillary circulation.

"2. Even if the arteries are extensively diseased, the arterial circulation to the smallest capillaries is surprisingly good except in the actually gangrenous areas. The force needed to produce an excellent arterial injection is decidedly less than that required for an imperfect venous injection.

"3. The return flow is normal if the artery is injected. If the vein is injected there is no return flow through the artery, but some of the fluid may be promptly short-circuited through immediately adjacent tributaries."

The author's survey of the published cases leads him to the conclusion that "brilliant results cannot be claimed for it, at least numerically." In the total of 136 published arteriovenous anastomoses, there have been 30 deaths immediately or shortly following it, and 11 deaths following the operation after an amputation, a mortality of more than 30 per cent. Of the cases that did not die, 45 have required amputation. Almost every case that was examined pathologically showed a thrombotic occlusion at the anastomosis or in the vessels below it. In 12 cases it was necessary to abandon the operation on account of too extreme occlusion of the lumen or too extensive disease of the wall of the artery, or because of thrombosis of the vein. "In other words, in more than 72 per cent. of the cases the operation or the attempt was practically a total failure." In 8 cases the result was inconclusive for one reason or another.

There remain 24 cases, in which the patient survived the operation and the limb escaped amputation. In 8 of these the subsequent history was unsatisfactory, so that only 16, or about 11 per cent., may be considered as successful, and of these, 11 are reported by four men, including Wieting, the main advocate of the operation. The author points out that this analysis doubtless presents the operation in its most favourable aspect, as it probably deals with almost all the successful cases, while unsuccessful cases have gone unrecorded. It is further pointed out that in all the successful cases the vessels were dealt with below the point at which the profunda is given off, and so the arterial circulation was not disturbed at all, or else an ample collateral circulation was always possible. "This fact rather justifies the suspicion that the extremity was saved, not because of the operation but rather in spite of it."

* ". . . The results of Horsley and Whitehead are quite what I anticipated they would be, *i.e.* the blood returns by the nearest anastomotic route, and there is no circulation in the periphery of the limb. In every respect their conclusions coincide with mine."

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

PREGNANCY AND CANCER OF THE BREAST.

J. L. FAURE and A. Pinard (*Ann. de gynéc. et d'obstét.*, 1914, xi. 386) have been impressed by the fact that text-books on pathology and on obstetrics either do not refer at all to the influence which pregnancy and cancer of the breast have upon each other, or, at the most, do so in a sketchy manner; and they have found the reason of the silence of the text-books in the rarity of the association. They have also noted that the co-existence of cancer of the *uterus* and pregnancy is by no means so uncommon. During a period of more than forty years one of the writers (Pinard) has seen numerous cases of pregnancy occurring in women already suffering from cancer of the uterus, but in only two instances has he observed gestation in women already attacked by cancer of the breast. An interesting clinical history is given. A primipara, 34 years of age, came into the Baudelocque clinique in December 1912. She had been the subject of infantile paralysis, and when 27 years old she had arthrotomy of the left ankle and resection of the right performed, with the result that she was enabled to walk without crutches. She had her first sexual connection when 32 years old, in 1911. At the same age it was noticed that the right nipple was somewhat retracted, and in the following year two tumours were observed by her in this breast and a swelling as large as a nut in the right axilla. During the month of April 1912 these tumours began to grow rapidly, and her menstruation, regular up till then, failed to appear. As the year went on, more indurated nodules appeared in the right breast, and when, in December, she was admitted to the Baudelocque clinique the condition of the mamma was regarded as one of polythelia. It was also discovered that she was near the full term of pregnancy, and that she had a pelvis obliquely contracted on the right side. The swellings, regarded at first as supernumerary nipples, were soon found to be cancerous growths, and on 6th December the right breast, the pectoralis muscle, and the glands in the axilla were excised by Faure. She was confined normally five days later, and made a good recovery both from the operation and the labour. Three months later, however, in March 1913, a second operation was necessary for the cancer of the breast, which had returned. At the time of writing both mother and child were alive. The case is a very interesting one, for the malignant disease of the right breast apparently grew slowly for two years, and then, on the occurrence of pregnancy, took on a rapid development. It seems fair to conclude that the rapid

development was due in some way to the supervention of gestation : at any rate one will readily agree with the authors in their conclusion, which is that, in the case of pregnant women every tumour of the breast existing before pregnancy, developing during gestation, or even appearing for the first time during it, should be extirpated as soon and as radically as possible. In the other two cases seen by Pinard, women of 28 and 30 years respectively, death from the malignant disease of the breast occurred a few months after confinement. The questions raised by Faure and Pinard are of great importance. They would seem to be chiefly three in number :—(1) Why is cancer of the breast so rarely associated with gestation? (2) Why does the association when it does occur apparently lead to rapid growth of the cancer? and (3) What bearing does the matter have upon the two general questions of the nature of pregnancy and the origin of cancer?

FIBROMATA OF THE BROAD LIGAMENT.

Dr. M. Haller has fully described two cases of fibromata of the broad ligament of the uterus (*Arch. mens. d'obstét. et de gynéc.*, October 1914, ann. iii. pp. 145-155), in one of which the tumour seemed to have originated in the broad ligament, whilst in the other it had obviously grown out into it from the uterus. In both cases the ligament affected was the left, in both the tumour was removed by abdominal section and subtotal hysterectomy, and in both the result was satisfactory. From a careful examination of the specimens and a scrutiny of the literature of the subject Haller draws certain conclusions. Fibromata of the broad ligament may be free, having no connection with the neighbouring organs; they may then be sessile (interstitial fibroma of the broad ligament) or pediculated (polypus of the broad ligament). On the other hand, they may originate in the uterus, and be of the sessile or the pedunculated type. Further, intra-ligamentary fibromata may arise in connection with the Fallopian tube, the round ligament, the ovary, or the utero- and tubo-ovarian ligaments. The origin of the intra-ligamentary fibromata which maintain their connection with the uterus or some other organ cannot, of course, be matter of dispute; but the origin of those which lie free between the layers of the ligament and have no connection with the neighbouring organs cannot be so easily settled. Some (*e.g.* Klebs and Virchow) have believed them to be always of uterine origin, and have thought of them as becoming detached from the uterus and set free between the two layers of the broad ligament; but Sängner suggested a purely local origin for them, considering that they might arise from the smooth muscular fibres in the ligament, from relics of the Wolffian body, from accessory suprarenal glands, and from supernumerary ostia or tubes (Gross and Lang). In both the cases reported by Haller, however, it seemed clear that the

fibromata were of uterine origin; in the one instance the connection had been maintained between the organ and the tumour, whilst in the other it had been severed.

PITUITARY EXTRACT IN OBSTETRICS.

K. A. Esbensen of Copenhagen gives his experience of pituitary extract in pregnancy, in premature labour, and in labour at the full term (*Arch. mens. d'obstét. et de gynéc.*, September 1914, ann. iii. pp. 100-124). He used both the pituitrine of Parke, Davis & Co., and the pituglandole of Hoffmann la Roche, but preferred the former. His conclusions are as follow:—Pituitary extract produces or increases the force of labour during confinement in most cases. The contractions occur rhythmically, with intervals which are regular, just as is the case with physiological contractions. It is not necessary to doubt the physiological character of the contractions produced by the drug because the blood-pressure is raised in the intervals; the same phenomenon is noticed with regard to physiological contractions when they become stronger. Abortion is not produced by pituitary extract, but the extract may produce a slight stimulating effect upon the contractions when a miscarriage is in progress, and it does not seem to do any harm by contracting the cervical orifice. In cases of premature labour the extract has the same effect when the labour is in progress as in ordinary full-time confinements; neither has contraction of the uterine orifice been noted under these circumstances. In full-time labours the best effect is got from the extract when it is given near the end; it is less certain at the beginning. Good uterine contractions do not become better by reason of the injection of the extract, but neither do they become tetanic. Indeed the extract may have a regulating effect upon painful, tetanic uterine contractions which are doing no good; it tends to produce regular contractions with regular intervals. A great rise of temperature seems to check the effect of the pituitary extract. In none of Esbensen's cases did the extract cause post-partum atony of the uterus, and in no case was its use dangerous to the baby. Heart disease is not a contra-indication to the employment of the extract, and neither is albuminuria with slight nephritis, but it is to be forbidden when eclampsia is feared. Among the indications for the use of pituitrine which Esbensen found are partial and total placenta prævia (6 cases), premature separation of the placenta (2 cases), hæmorrhage from other causes (1 case), primary uterine inertia (4 cases), secondary uterine inertia (37 cases), threatening asphyxia and secondary inertia (20 cases), fever and secondary inertia (6 cases), contracted pelvis (2 cases), uterine inertia with hydrocephalus (1 case), uterine inertia after prolapse of the cord (1 case), and delayed labour with rigidity of the cervix (1 case).

GANGRENE OF THE LIMBS IN THE PUERPERIUM.

Little reference is commonly made to puerperal gangrene of the extremities in current obstetrical literature, and Charles Greene Cumstone (*Amer. Journ. Obstet.*, 1915, vol. lxxi. pp. 53-61) has done well, therefore, in summarising recent advances in the knowledge of the malady and in its treatment. There are three types, those in which the process is due to an occlusion of the arterial system, of the venous system, or of both (arteriovenous); and the commonest type is arterial occlusion resulting in dry gangrene. The causes of occlusion may be classified as follows:—

A. *Occlusion of the Arterial System.*

1. Embolism from endocarditis.
 Embolism from thrombus of the left heart.
 Embolism from paradoxal embolism (that is to say, an embolus starting from the placenta reaches the right auricle and is carried into the left heart by way of a patent foramen ovale, and not into the right ventricle and pulmonary artery).
2. Primary arteritis from septic or toxic endarteritis.
 Secondary arteritis by propagation of the inflammation of the neighbouring veins.
3. Primary thrombosis coming from the uterine artery or its placental ramifications.
 Secondary thrombosis from total occlusion of the circulation in the venous system.

B. *Occlusion of the Venous System.*

1. Primary phlebitis: septic or toxic thrombophlebitis.
 Secondary phlebitis from a metrophlebitis, an extension of the inflammation of a neighbouring artery, or by contiguity.
2. Primary thrombosis, commencing in the veins.
 Secondary thrombosis due to arrest of the circulation in the corresponding artery.

This is the classification adopted by Wormser, and Cumstone, whilst generally in agreement, thinks that the possibility of gangrene from venous occlusion, without participation of the arterial system, is a very slight one, for the simple reason that a collateral circulation forms too quickly for blood stasis to become absolute. Undoubtedly arterial obliteration is the most frequent agent in producing puerperal gangrene: the chief cause is infection, and it is very likely that in all cases a puerperal endometritis is the starting-point. From the endometrium, either by the lymphatics or blood-vessels, the infection progresses, giving rise first to a metrophlebitis and then to a phlebitis of the limbs. Prognosis is still serious, but better results have been recently obtained.

In the arterial type the possibility of successful amputation contributes to a favourable outcome, whilst in the venous types, where treatment can only be directed to the general condition of the patient, the mortality is very high. Wormser's statistics for amputation were eighteen recoveries out of twenty-four cases—a mortality of 25 per cent.; there were thirty other cases in which amputation could not be done, and they all died. Winterer's statistics were not quite so good, ten out of twenty-three amputated cases dying and all the ones in which amputation was impossible. J. W. B.

THERAPEUTICS.

UNDER THE CHARGE OF

JOHN EASON, M.D., F.R.C.P.

TREATMENT OF SCIATICA.

LESZYNSKY (*Med. Record*, 6th February 1915) has treated 160 cases of sciatica by perineural infiltration with physiological saline solution. In a previous paper (*ibid.*, 17th February 1912) he reported on results obtained in 25 of these.

The number of injections required for the individual case varied from one to six and averaged three. Complications, or unpleasant symptoms have never been encountered. Under proper technique and strict asepsis it is a harmless operation. With his extended experience he is able to reiterate the statement made three years previously, that the method "is a valuable acquisition in relieving the pain of sciatica, whether acute or chronic." Several patients have not reacted satisfactorily, but these have been exceptions. In subacute and chronic intractable cases it has proved the most satisfactory treatment that has yet been devised, says Leszynsky.

In over 75 per cent. of his cases sciatic perineuritis was assumed to exist, and this type of sciatica seems to be most amenable, and reacts more rapidly, to this mode of treatment which was introduced by Lange of Leipsic in 1907. The procedure consists in the injection of a large quantity of fluid under pressure directly over the sciatic nerve. Lange originally used a solution containing beta eucaine, but Leszynsky states that the saline solution alone proves adequate, and in every way satisfactory. It was claimed by Lange that the favourable results were entirely due to the mechanical action of the fluid in loosening, stretching, or breaking up adhesions in the neighbourhood of the nerve. Relief is frequently prompt and permanent in acute and very recent cases, and Leszynsky is therefore of opinion that such result must be due either to blocking of sensory conductivity or to the production of changes in the circulation and nutrition of the perineural structures by the presence and absorption of the fluid

injected. The technique is as follows:—During the application of the treatment the patient should lie on the abdomen, with the legs fully extended. A firm pillow is rolled and placed under the lower part of the abdomen in order to relax the gluteal muscles. The following measurements are made for locating the nerve:—a line is drawn from the sacro-coccygeal articulation to the postero-external border of the great trochanter; at the junction of the inner and middle thirds the spine of ischium is found. One inch to the outer side of this is the point of puncture. An area of skin about 4 cm. in diameter is painted with iodine, the point of puncture being in the centre. The syringe used is all metal, holding 60 c.c. (2 ounces). It has a slip tip which allows the needle to fit the barrel directly. The needle is of steel 12 cm. long, with a calibre of 2 mm., and provided with a sharp point, which is protected by a dull tipped stylet projecting 1 mm. beyond the point of the needle. In puncturing the skin and subcutaneous tissue, the stylet is withdrawn beyond the cutting edge. It is then replaced, and the needle pushed in perpendicularly. When the sciatic nerve is reached, at a depth ranging from 6 to 12 cm., the patient may feel either a sharp pain radiating from the point of contact to the popliteal space or down to the foot, or a sharp pain in the corresponding heel; or there may occur a jerking movement of the leg, or a sudden twitch in the calf muscles. Some patients complain only of diffuse pain in the buttock. The stylet is then removed. The syringe having been filled with sterile physiological saline solution at a temperature between 95° and 100° F., the fluid is rapidly injected. The quantity used is from 80 to 120 c.c. The needle is withdrawn, the iodine washed off with alcohol, collodion and sterile plaster applied. The patient is then instructed to lie in bed for 12 to 24 hours. No anæsthetic is required. Strict aseptic precautions are absolutely essential. Soon after the injection some aching pain, with a sensation of heaviness and numbness in the limb, usually follows, but lasts only for a short time. In some cases the sciatic pain in the thigh disappears within twenty-four hours, but the pain continues in the leg in the course of the peroneal nerve. This is often promptly relieved by an injection of 15 to 30 c.c. in the region of the nerve at the head of the fibula. The interval following the first injection before another is given will vary with the degree of relief obtained. Leszynsky waits from 36 hours to one week.

As a rule, those injections under pressure are attended with comparatively slight pain, and this usually arises during the early period of the injection. As soon as heaviness and numbness in the extremity are felt, no further pain results from the introduction of additional fluid. In the majority of instances the treatment is not painful. It should be borne in mind that the object is to produce infiltration of the nerve and the surrounding structures. It is not intended that the

nerve-sheath should be entered by the needle. Should such a large quantity of fluid be forced into the trunk of the nerve disagreeable consequences, such as paralysis and traumatic neuritis, would probably ensue. In the construction and use of the special needle precautions are taken to avoid puncturing a blood-vessel or the nerve-sheath.

It has been a very common experience, says Leszynsky, to see men with sciatica, who have been incapacitated for several months without securing adequate relief from the usual forms of treatment, rapidly relieved of pain and restored to activity by this method.

In the 160 cases reported there was no evidence of joint or pelvic involvement. The fact that many of these patients were rapidly and permanently cured by a single injection in the neighbourhood of the painful sciatic nerve is ample evidence of the affection being limited to that circumscribed area. This experience is an adequate refutation of the statement recently made by Dr. Wm. Bruce, that sciatic pain is always a symptom either of arthritis at the hip or sacro-iliac joint, or of pelvic disease.

From an economic standpoint this method of treatment is superior to many other forms of treatment, inasmuch as in the majority of instances it rapidly relieves the pain, and the sufferer is soon enabled to return to his customary vocation.

It is pointed out by Strauss (*ibid.*, p. 213, 6th February 1913) that epidural injection of saline solution has one advantage over perineural injection of the sciatic nerve. No injury to the nerves has been reported following an epidural injection. The *rationale* of the treatment is that many cases of sciatica are due to an affection of the nerve roots forming the sciatic nerve. Déjerine has applied the term *radiculitis* to this class of cases. For this mode of injection the needle must be 8 cm. in length and 1 mm. in calibre. It must be strong, or else it may break when forced through the sacro-coccygeal ligament. It must be inserted to a depth of 6 cm. to reach the second sacral vertebra, with the patient preferably in the knee-chest position. The opening — the foramen sacrale superius — through which the needle passes lies generally 2 cm. above the end of the gluteal fold. It may be further identified as it lies at the end of the crest formed by the spines of the sacrum, is bordered laterally by two bony prominences, and has the shape of an inverted V or U.

THE TOXIC POSSIBILITIES OF TOBACCO SMOKE.

Culverwell states (*Dub. Journ. Med. Sci.*, April 1915) that, according to recent investigations, nicotine is not the only toxic factor. The chief components of tobacco smoke may be separated in two groups—(1) Water, carbon dioxide, and carbon monoxide. (2) Nicotine, aldehydes, and ammonia compounds.

In the first group the most important is carbon monoxide,

which, by forming a rather stable hæmoglobin compound, interferes with the normal oxygen-carrying power of the blood. Its virulent nature may be judged from the fact that 0.4 per cent. in the atmosphere is sufficient to cause death. Usually the gas is contained in smoke only in minute amounts; but where tobacco is burned without a free supply of oxygen, charring of the leaf takes place and larger quantities are formed. This condition is to some extent fulfilled when a cigar or pipe burns unevenly, and the unpleasant results on the smoker are well known. Carbon dioxide, though present in larger quantities, does not appear to have any effects of great importance, although, if the smoker inhales, the respiratory exchange must be altered to some degree. Culverwell calculates that the average percentage of this gas inhaled by one who practises inhalation is 0.6, or some twenty times that contained in normal air.

The amount of nicotine contained in tobacco leaves varies from 1 to 8 per cent. The effects of nicotine are mainly on the nervous system, which at first is stimulated and later depressed. Several effects of nicotine commonly observed in smokers are due to the initial stimulation of the autonomic ganglia. Amongst these are increased peristalsis and constriction of arterioles, causing a rise of blood-pressure when ordinary amounts of tobacco are consumed.

Nicotine is very readily absorbed by mucous membranes. Elimination is effected mainly by the kidneys, but also by the lungs and skin, and is accompanied by diuresis.

An ordinary pipeful of tobacco contains enough nicotine to kill about twenty dogs. Experiment proves that a large proportion (20 to 97 per cent.) of the nicotine is destroyed during combustion. It is also probable that a considerable tolerance of the drug may be acquired. There is little difference in the amounts of nicotine found in the smoke of the Virginian and Turkish tobaccos.

The smoking of brown paper and similar substances containing no alkaloid may give rise to toxic symptoms comparable to those produced by tobacco. There is evidence to show that these may be due to aldehydes. A number of these are formed by the combustion of tobacco. Formaldehyde is present in small quantities, and the statement has been made that the destruction of nicotine is partly caused by its combination with formaldehyde.

In the present connection the most important aldehyde is furfural, contained also in the fusel oil of whisky and other spirits. The pronounced toxic action of this substance is well known. Little is known, however, as to its precise action on the body. Small doses readily give rise to ataxia, and it is eliminated rather slowly. On the basis of the *Lancel's* researches it is estimated that one cigarette may yield as much furfural as about two ounces of crude whisky. It appears, then, that relatively enormous quantities of furfural are inspired in

smoking. The same is true of nicotine, as a considerable amount remains in the smoke.

If these poisons were completely absorbed during their sojourn in the respiratory passages, serious or fatal results would probably ensue. It is likely that the amount actually absorbed is small, varying with the extent to which the smoke penetrates the passages. Whilst the area of the buccal mucous membrane is at most but a few square inches, Leonard Hill places the total lung surface at 100 square yards—a fact indicating the danger of inhaling.

Virginian tobacco smoke contains less nicotine and more furfural than Turkish tobacco. Again, the relative amounts of these present in any tobacco smoke is affected greatly by the manner in which the combustion is carried out.

Cigarette smoke contains much furfural and little nicotine, while pipe smoking reverses the yield. Consideration of these results suggests that the well-known injurious effects of cigarette smoking are due more to excess of furfural than to the action of nicotine.

The ammonium is chiefly present as the chloride. It has an action on various systems which is, in some respects, adjuvant to that of nicotine.

A minor point is that greatly increased quantities of potassium sulpho-cyanide are present in the saliva of smokers, increased excretion continuing for weeks after the habit is given up entirely. This suggests that some tobacco product has a cumulative action and is slowly excreted in this form.

J. E.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

W. G. SYM, F.R.C.S., AND ANGUS MacGILLIVRAY, M.B., D.Sc.

OCULAR ANAPHYLAXIS.

ANAPHYLAXIS is the condition of the animal organism in which contact with a toxic or other substance of heterogenous origin has produced a tendency to reaction, on subsequent contact with the same toxin, more intense than was the original response. Much study has been devoted to this matter as affecting the organism generally; in a long paper written by Schoenberg (New York) the subject is treated from the point of view of eye disease in particular. At the outset he mentions four conditions in the production of which anaphylaxis may bear a part, and perhaps an important part; but, so far, this is pure speculation. In phlyctenular ophthalmia, and in the vastly more serious condition of sympathetic ophthalmia, to mention two of these, some see the action of anaphylaxis. Interstitial keratitis, that commonest of all the ocular manifestations of inherited syphilis, has been explained as

the result of a lowered general resistance to the inroads of the spirochaete, occurring from some perhaps transitory and—in itself—unimportant cause during childhood or about puberty; the patient has already, when in the foetal condition, been infected with the organism, and the cornea, thus sensitised in early days, react intensely to the increased action of the syphilitic virus, which, with this lowering of the general tone, attacks the cornea more powerfully. Fourthly, the suggestion is offered that wounds of the eye may owe some of the severity of the inflammation consequent upon receipt of them to a toxin present in the secretion from the conjunctiva, whose irritative properties are increased by the introduction of dead bacilli.

The eye may be used for the demonstration of a general somatic immunising process, and, conversely, the generalised condition may take its origin in an infective process starting in the eye. Thus immune bodies produced in the tissues have been demonstrated to be present in the aqueous humour, and the bodily organism may be immunised or sensitised by a local infective process limited to the eye.

Schoenberg set himself to find the answers to three questions—(1) Does the eye participate in the process when the entire organism is in a state of anaphylaxis? (2) Can we sensitise the organism by introducing into the eye a heterogenous albumin? (3) Is it possible that a state of anaphylaxis should arise in the animal body without the introduction of a foreign albumin?

As the foreign serum to be introduced into the rabbit (the animal which he chose to employ for the purposes of the investigation) Schoenberg selected human albumin and tuberculin B.E. One main reason in his mind for the selection of human albumin for this purpose was the hope that after his experiments had progressed a little he might be enabled to draw a distinction in respect of the reaction between the serum of a healthy person and that of one affected with gout, with syphilis, with arteriosclerosis, but in this hope he has so far been disappointed, for as yet no light has been cast upon the problem. In respect to the injection of tubercle he found that the eye is more readily and surely sensitised when the first injection is made subcutaneously than when it is made into the eye itself. He considers that his experiments prove in addition that tuberculin is not of itself a strong irritant to the eye, and only acts in this way when the animal has already been sensitised (*Ophthalmology*, xi. 1).

DETACHMENT OF THE RETINA.

There are some very gloomy subjects in ophthalmology, and most surgeons would agree that there are few of the commoner diseases of which the prognosis is more generally depressing than it is in detachment of the retina. This formed the subject of an anxious discussion,

carried on at a high level of excellence, at the recent meeting of the Ophthalmological Society.

Three papers by Mayou, Paton, and Ramsay introduced the subject, and all three authors had something interesting and something enlightening to say. To take them in alphabetical order and to pick out some gems of thought, Mayou dealt chiefly with the pathology of the disease, both as it occurs under ordinary conditions and as it is found congenitally. He discussed briefly the three main theories of its origin, viz. the old theory of von Graefe, that it is due to an exudation into the "inter-retinal space" (for the term detachment of the retina is not strictly accurate, since the whole thickness of the retina is not detached, but it becomes separated off between the pigment cell layer and that of the rods and cones); that of Leber and Nordenson, that it results from contraction of the vitreous humour pulling off the retina from the choroid; and that of Raehlmann, that the fluid which separates the retina reaches the "inter-retinal space" by diffusion from the vitreous. Mayou expresses himself an adherent of the first theory, admitting at the same time that one explanation may perhaps not fit every case, and offers serious criticism of the two latter theories. Should a fluid be exuded into the inter-layer (potential) space in the retina, this fluid, being more albuminous and of higher specific gravity than that internal to the membrane (*i.e.* within the vitreous chamber), detachment is bound to occur and a shrinking process to take place in the vitreous, but he believes, and gives good ground for believing, that this atrophic process is not itself the true cause of the morbid condition. He points out the really weak spot in the "fibrous contraction of the vitreous" theory, namely, that detachment produced in this way presupposes firm attachment between the retina and the vitreous, which simply does not exist, and a very powerful drawing action of the contracting bands in the vitreous, sufficient to produce a potential vacuum behind the retina, of which there is certainly no evidence.

As everyone knows, detachment occurs with much greater frequency in myopes, the reason for which seems plain enough; but a point in this connection, the meaning of which is not so obvious, is that it is not so much the degree, as the fact, of myopia which seems to be important; at all events, according to some observers, the proportion of cases of detachment found in the higher degrees of myopia, as contrasted with the more moderate, is not so overwhelmingly great as might be expected.

Mayou finds in the occurrence of congenital detachment strong support to the theory that the disease is due to effusion of fluid into the inter-retinal space. These cases are not seen clinically, for they occur in malformed microphthalmic eyes; they seem to be produced by the failure on the part of the layers of the optic vesicle to come into apposition, with consequent collection of fluid between them. This is

quite analogous to what is found in the ventricles, in cyclops, and in spina bifida.

Paton, whose paper was built on somewhat different lines from that of Mayou, dealt to a greater degree with cases arising as the result of trauma, and illustrated certain differences in the mode of production. He considers that rupture of the membrane of Bruch is an important factor in this, and he quotes also with approval the suggestion put forward by Vail, that just as in myopes there is atrophy (from disuse?) of the circular portion of the ciliary muscle, so there may be diminution of aqueous secretion from the ciliary body, with consequent lowering of intra-ocular tension, and degeneration of the vitreous humour.

Ramsay's paper, again, was largely clinical; he showed how, from want of sound knowledge of the etiology of detachment, we are apt to blunder badly in our mode of treatment, and how certain of the plans suggested (and, alas! employed) are in point of fact more likely to produce or increase detachment than to cure it. Further, he showed how in the history of the therapeutic measures employed numbers of schemes have found temporary favour, followed by permanent oblivion, for they have been suggested by a sort of hopeless groping for any straw, engendered by our want of knowledge of the pathology. Whenever there come to be advocated a multitude of varying modes of treatment, one may be certain either that the disease is one in which spontaneous recovery is likely to take place or one which is practically hopeless. Detachment of retina most certainly does not belong to the former category, but neither will Ramsay allow that it should be included in the latter. He recommends a line of treatment by which he has been able to secure results which he states with moderation but with hope, and which are all the more calculated to impress the *cognoscenti* that he is not extravagant in his claims of invariable or of complete cure. In general terms, the plan he advocates consists in dorsal decubitus, pressure bandage, and a combination of withdrawal of the fluid behind the retina and subconjunctival injections. For the details of the procedure, no part of which he claims as his own, this is not the place, but the due conjunction of all has been carefully thought out by him.

One of the latest ideas in treatment has been put forward by Lagrange, the well-known French surgeon. He regards the lowering of tension, which is an almost invariable accompaniment of detachment, as not merely a sign of evil, but as an evil in itself, and endeavours to combat this by reducing the facilities for escape of the intra-ocular fluids. He aims to accomplish this by superficial cauterisation round the limbus corneæ in order to establish a band of fibrous tissue which, by contraction, will hinder the outflow of fluid. Some time will require to elapse before judgment can be arrived at regarding the merits of this new suggestion.

Something remains to be said in regard to the prognosis in cases of detachment. There is no doubt that the prospects are, as a rule, bad, but remarkable examples of more or less complete recovery do occur, sometimes spontaneously, sometimes while the patient is under treatment. Instances of this sort of thing have been seen by most surgeons, but chiefly among the cases of traumatic origin, in which the prognosis is much more cheerful than it is in the idiopathic type. Mr. Paton mentioned one or two, so did Dr. Ramsay, including an example in which detachment in one eye became replaced while the patient was awaiting cataract operation in the other. Such cases "turn up" now and again: one is described by James in the *Ophthalmic Review* of January last. A further point was mentioned by one of the writers, namely, that while one would not unnaturally expect that removal of the cataract from an eye which also suffered from detachment was an operation likely to be attended by little or no benefit, and, indeed, perhaps by further loss of sight, that does not appear to be the case as a practical matter, and the patient frequently enough obtains and retains better vision than might have been expected. It appears strange that when the retina is already detached, reduction of the contents of the globe anterior to the separated membrane should not in every case aggravate the mischief.

Yet another curious circumstance has been noted, viz. that in some instances the retina has become reattached, and yet has remained blind, so that the individual patient in question reaped no benefit from the cure of his pathological condition. The cure was no cure. That may be, and yet it may point to a brighter future, for if we can bring about reattachment of the retina (perhaps it would be more accurate to say replacement of the retina) by any means, our next step in progress may be to effect this happy result before the physiological activity of the membrane is finally extinguished. Some surgeons, indeed, consider that while it is detached the retina is merely for the time incapable of exercising its function, and that it is still potentially active and only waiting to be put in contact with the choroid again, when it will resume its physiological responsiveness. That happy state of affairs may be the actual condition sometimes, but there can be little doubt that the function of the retina is very rarely re-established.

W. G. S.

NEW BOOKS.

Defective Children. Edited by T. N. KELYNACK, M.D. Pp. 460.

London: Bale, Sons & Danielsson. 1915. Price 7s. 6d. net.

THIS book contains twenty-seven essays by different writers. Seven deal with defective children in various countries, the others discuss particular defects or particular classes of defective children. The

aim of the book is "to provide reliable and authoritative information regarding the chief classes of defective children requiring special medical supervision and educational care." We may say at once that this aim is successfully achieved. The volume is intended specially for medical inspectors of schools, and no medical inspector can study it without gaining a large amount of valuable information, and the bibliographies which conclude each essay will show him where to go for more. The chief defect of the book, as of most symposia of the kind, is that it is very incomplete, particularly with respect to educational methods suitable for defectives, concerning which every school doctor should know a good deal more than is here provided. No doubt this is due to the fact that all the writers are doctors, except one, who is a dentist. Had a psychologist been included among the writers on mental deficiency there would surely have been some discussion of mental tests and their uses, yet there is none—a serious omission. The Board of Education have recommended the use of the Binet-Simon tests in examining defectives under the Mental Deficiency Act, yet these well-known tests are not even mentioned by any of the British writers, and Dr. Dufestel merely refers to them as being in use in France. The experiments of De Sanctis with Griesbach's aesthesiometer are described (but the names are printed each time De Sanctos and Greisback), yet no mention is made of the De Sanctis intelligence tests. One or two of the contributors have allowed themselves to write in very slipshod English. Taken as a whole, however, the volume may be warmly recommended as an interesting and useful one. It may be added that Scotland is well represented among the contributors.

The Early Diagnosis of Heart Failure, and other Essays on the Heart and Circulation. By T. STACEY WILSON, M.D.(Edin.), F.R.C.P. Pp. 617. With 175 Illustrations. London: Smith, Elder & Co. 1915. Price 12s. 6d. net.

THE results of thirty years' clinical observation of the heart are embodied in this volume, giving it a strong claim to attention and consideration. The essays of which the book is made up have been written at various times during the last twenty years, and there is thus an absence of the appeal to the evidence of graphic methods which bulks so largely in most of the recent literature of cardiac disease. The author depends chiefly upon the careful observation of the physical signs of heart failure, and adduces illustrative cases in support of his contentions.

The varying distensibility of the muscular chambers of the heart at different periods of life plays an important part in Dr. Wilson's conception of the mechanism of heart failure. It is ingeniously used to explain the varying signs of failure met with in adolescents and in older patients.

Various signs not generally recognised as indicative of myocardial

weakness are made use of by the writer in the diagnosis of this condition. One of the most fully discussed of these is a rise in the level of the diaphragm ascribed to a diminution in the amount of blood in the thorax.

Various murmurs which have not obtained general recognition are described and exemplified. The opinion is expressed that the current interpretations of venous tracings are inadequate, and that a more important part must be assigned to contraction of the muscular wall of the veins. Another point mentioned—which, we believe, needs to be emphasised at present—is the danger of drawing far-reaching deductions as to the strength of the heart muscle from isolated observations of the systolic blood-pressure, and of basing upon these schemes of treatment which may prove far from beneficial. The book requires close reading to follow the arguments presented. Its reliance so largely upon physical signs, and especially upon exact percussion results, may be considered a weakness. Certainly only very exact observations could justify some of the conclusions arrived at. It is, however, a valuable and interesting record of results obtained by the careful employment of means of examination within the reach of all.

BOOKS RECEIVED.

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EDINBURGH
MEDICAL JOURNAL



EDITED BY
ALEXANDER MILES & J. S. FOWLER

Founded 1805. JANUARY 1915. New Series, Vol. XIV. No. 1.

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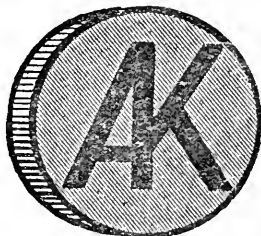
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